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ABSTRACT

This report describes a project which analyzed science and social studies textbooks to determine how well they accommodate the learning needs of mainstreamed hard-to-teach students. A textbook analysis tool was developed, and eight teacher-reviewers examined the instructional design of teachers' and students' editions of 12 leading elementary and secondary science and social studies textbook programs. Forty additional teachers were then asked to verify the reviewers' findings. Recommendations for publishers are organized within the three phases of the learning cycle: getting students ready to learn, engaging students in the learning activity, and having students demonstrate competence and extend knowledge. For each of the three phases of instruction, the report summarizes the findings of the textbook analysis by content area and grade level. The primary finding of the analysis was that textbooks failed to incorporate effective methods of instruction, particularly at the secondary level. Publishers are urged to build in activities that set the stage for reading, make students active participants in learning, teach students how to use reading and self-monitoring strategies, and provide numerous opportunities to demonstrate mastery in a variety of ways. The report concludes with appended sample activities for teachers to make better use of existing textbooks, as well as a list of the 12 textbooks analyzed and lists of references and readings. (JDD)

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TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

This study analyzed twelve leading science and social studies textbooks (K-12) to determine how well they accommodate the learning needs of hard-to-teach students. Our purpose was to formulate and disseminate recommendations to publishers and others interested in improving textbooks for diverse learners. The project, funded by the U.S. Department of Education, Special Education Programs, also asked teachers to recommend strategies for overcoming the limitations of existing textbooks.

We accomplished these goals by designing a text analysis tool and having a separate group of practitioners use it to analyze the texts. Project findings were disseminated at a national conference attended by publishers, educators, researchers, teacher trainers, professional organizations, and textbook adopters.

This publication is the conference report. It includes the major findings of the analysis, recommendations for publishers, and strategies for teachers. Our primary finding was that textbooks failed to incorporate effective methods of instruction, particularly at the secondary level. To improve textbooks we recommended that publishers and teachers build in activities that set the stage for reading; make students active participants in learning; teach students how to use reading and self-monitoring strategies; and provide numerous opportunities to demonstrate mastery in a variety of ways.

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OVERVIEW OF THE PROJECT

THE PROBLEM

One of the many challenges facing educators today is how to meet the needs of a very broad range of students with diverse abilities and interests who are in mainstream classes. In addition to normally achieving students, a mainstream classroom may have limited English proficient students; students with learning disabilities, emotional disturbances, and sensory impairments; students who lack interest; and gifted students. In many of these classrooms, teachers use textbooks as the basic tool for instruction. It has been estimated that students spend as much as 75 percent of their classroom and 90 percent of their homework time directly involved with textbooks. Moreover, the primary means for structuring the scope and sequence of the regular education curricula is achieved through textbook adoption and use.

Most textbooks, however, are designed for use with students who do not have learning problems or other impediments to accessing information. One result is that a large number of students with learning problems have difficulty accessing information from standard textbooks. Classroom teachers face the difficult challenge of using the same books with students of varying abilities and find they must supplment textbook-based instruction with materials or strategies to meet the needs of the diverse student population in their charge.

FACING THE PROBLEM

In an effort to respond to the demand for excellence in education, the increased need for instructional coordination between regular and special education, and the calls for help from educators, parents, and students, the U.S. Department of Education, Office of Special Education Programs (OSEP), supported a number of efforts aimed at making textbooks more usable for students with learning problems and for aiding teachers in overcoming the limitations of textbooks. Building on knowledge gained from curriculum materials developed in the 70's and the textbook adaptations in the early part of this decade, OSEP funded a project that ultimately requires the collaboration of educators, researchers, and publishers to improve the usability of textbooks.

Components of the Study

Over an 18-month period, the multi-phased project involved several components: conducting an extensive review of the literature on learners and effective instruction; developing an instrument to analyze textbooks; having teachers use this analysis instrument (and its revised versions) to evaluate science and social studies textbooks; developing a set of recommendations; and holding a national conference to bring together publishers and the marketplace.

Exhibit 1 presents an outline showing the sequence of the major tasks of the project, a brief description of each one, and what was learned.

OVERVIEW OF PROJECT TASKS

ACTIVITY/DATE	BRIEF DESCRIPTION	WHAT WE LEARNED
Review of Past Research November 1986 - February 1987	In-depth review of literature and consultation with project advisory panel, drawn from publishing, special education, and science/social studies community.	o Many students with learning problems are mainstreamed in regular social studies & science classes. o Common problems exist across groups of students with varying learning problems. o Several promising instructional strategies have proven effective with these special learners and may also benefit all learners.
Textbook Analysis March - April 1987	Comprehensive analysis of 12 leading social studies and science textbooks by eight experienced and well-trained teacher reviewers.	o Many texts fall short of helping teachers accommodate the increasingly diverse classroom population, particularly textbooks at the secondary level.
Verification of Textbook Findings June 1987	Forty teachers met for two days to discuss textbook findings and generate strategies for teachers to compensate for textbook limitations.	o Teachers agreed that textbooks, in general, could be improved and better designed in order to meet the needs of more students in a given classroom. o Teachers called for guidelines to help them become better textbook selectors and users: they found the "streamlined" tool useful in helping them evaluate textbooks.

Review and Analysis of Current Trends July 1987 - December 1987	Staff continued to review the research, consult with scholars and project advisors, meet with publishers and other interested parties.	**Textbook selectors should assess instructional design in conjunction with content, since the former helps ensure that students access the content.**
Preparation of Streamlined Text Analysis Tool October - January 1988	Pilot testers, teachers, and advisors reviewed the tool that can be used to examine instructional design of teacher and student materials	**The tool can help teachers and others determine how well a textbook program accommodates diverse learners and also help publishers assess and improve their own texts.**
Preparation of Conference Report December 1987 - January 1988	Project staff prepared a synopsis of textbook review findings, publisher recommendations, and possible solutions for teachers.	
Publishers' Conference February 1988	Over 100 selected educational leaders (teachers, school administrators, state adoption committee members, curriculum developers, scholars, teacher trainers) as well as key educational publishers will meet in Washington, D.C. to discuss project findings and recommendations. Participants will generate viable action plans for improving textbook usability.	**o Market needs will be expressed.** **o Publishers will see that the market is ready for more usable instructional design in textbook programs.**

Although the national conference is held at the end of the project, it is viewed as a beginning, a "commencement." It is the forum for sharing recommendations for improving textbook usability with the teachers who have to use textbooks, the university and college teachers who train teachers, the educational researchers who study the learning process, the educators and parents who select textbooks, and the publishers who produce them. By bringing together these key players, every important group can be represented; all can have a voice in saying which of our many recommendations are really practical, useful, and feasible in a classroom. By bringing together publishers and the market they sell to, publishers can see that the buyers and users of their books are ready for change and excited about an approach that translates our recommendations into practice.

SCOPE OF THE TEXTBOOK ANALYSIS

We looked at instructional design features of textbook programs. We defined a textbook program as the teacher's edition, the student's edition, and all ancillary materials (e.g., workbooks, kits, resource books, test booklets, lab manuals). By instructional design features, we mean the pedagogy built into the program that suggests how the book be used (e.g., activating students' prior knowledge, linking it to the new information, teaching reading and learning strategies). Our interest focused on how well the instructional design and textbook features of content area textbook programs accommodate the diverse needs of students in the classrooms of today and tomorrow.

We did not examine textbook content although we acknowledge its importance and its significant relationship to the instructional design. A well-designed textbook program (i.e., pedagogically sound instructional strategies, clear paragraph and lesson structures, logically related chapters, and high quality writing) will only enhance the content and, therefore, comprehension. (For text analyses related to content, see Gagnon, 1986; Cheney, 1987; Larkins and Hawkins, 1987.)

It is also important to point out that we did not examine readability. Numerous scholars and educators have identified the use of readability formulas as impeding the effort to improve the quality of textbook writing. Readability formulas have been criticized because they result in prose that contains short sentences and simple vocabulary, and exclude connectors that can help make the text easier to read. Armbruster, Osborne, and Davison (1985) point out that readability formulas fail to take into account important characteristics of both the text and the reader that affect comprehension: for example, in the text, the content difficulty, organization of ideas, the author's style, and page layout; in the reader, motivation, interest, purpose, and perseverance. Bernstein and Woodward (1986) and many others interested in textbook reform have called for a stop to the use of formulas and recommend that the quality of textbook writing be closely examined in the textbook adoption process.

There were two findings that surfaced in the process of analyzing the textbooks that are worth noting although they do not relate to instructional features. The twelve programs we reviewed were considered generally visually appealing with good design and graphics. However, since there is some evidence that illustrations may distract poor readers, there is a need for more research into the effect of graphics on poor readers.

Second, there was substantial discussion about the usability of ancillary materials. Concerns centered around the sometimes weak relationship between the ancillary materials and the context of the lesson, the lack of direction for their use, and the assortment of components that made their access frustrating.

Theoretical Framework for Analysis

A rich body of theory and principles has developed in the field of cognitive science over the past decade. The theory helps make clear how learners acquire and integrate knowledge.

> Whether we are aware of it or not, it is the interaction of new information with old knowledge that we mean when we use the term comprehension. To say that one has comprehended...is to say that s/he has found a mental "home" for the information...or else that s/he has modified an existing mental home in order to accommodate that new information (Anderson and Pearson, 1980, p. 255).

Simply stated, the theory tells us that:

- one learns and remembers information by associating ideas to one another
- learning and memory increase when learners relate information to their knowledge store and to their experiences

To be effective, textbooks and teachers must explicitly help learners generate and integrate information.

Recent research on language and literacy development has focused on strategies that effectively help learners generate meaning by integrating old and new information. These strategies help learners generate meaning as they construct relationships between their knowledge, their memories of experience, and what they are learning (i.e., reading, doing, listening, observing). This view of learning emphasizes the important roles past experience and prior knowledge play in generating meaning. Based on this notion, many researchers have designed interventions to help learners activate past experiences and knowledge before they engage in learning tasks. Other researchers have focused on facilitating the process of constructing meaning by helping learners to explicitly integrate activated (old) information with new information while they are engaged in the learning situation (e.g., hearing a story, watching a demonstration, reading a book, conducting a science experiment, or viewing a filmstrip).

Powerful principles that flow from these theoretical underpinnings guide our analysis of textbook features and suggest recommendations for textbooks and teachers. To aid students with diverse learning needs, materials and accompanying instruction should:

- activate students' prior knowledge and past experiences based on what is in the text and the objectives of instruction

- extract relevant information from what is being presented, discussed, or viewed
- integrate new information with what the learner already knows
- organize integrated information into meaningful frames of reference using appropriate graphic displays
- apply/extend new information by engaging in purposeful activities
- make the learning process explicit to students by explaining how they can apply the previous five principles and providing opportunities for students to give feedback on the process

Our findings and recommendations also stress the importance of ongoing evaluation as a key element in the instructional process. It is essential to include a feedback loop for teachers to evaluate the progress of their students at the same time that they are judging the effectiveness of their instructional strategies.

Phases of Learning

Based on theories of effective instruction and on the traditional format of most textbooks, we view the learning cycle as having three phases: (1) Getting Students Ready to Learn, (2) Engaging Students in the Learning Activity, and (3) Having Students Demonstrate Competence and Extend Knowledge. These three phases are not distinct but overlap. Each phase includes separate objectives.

I. Phase I: Getting Students Ready to Learn
   - Focusing Instruction
   - Activating Prior Knowledge
   - Previewing Concepts, Vocabulary, Text Structure

II. Phase II: Engaging Students in the Learning Activity
   - Helping Students Comprehend Information in the Textbook
   - Teaching Study Strategies
   - Providing Experiential Activities
   - Emphasizing Metacognition
   - Employing Cooperative Teaching Strategies

III. Phase III: Having Students Demonstrate Competence and Extend Knowledge
   - Having Numerous Opportunities to Demonstrate Mastery
   - Providing a Variety of Ways to Demonstrate Competence
   - Extending and Applying Learning

Description of Analysis Tool

Based on the knowledge we gained about the nature of learning and the characteristics of the learner, we developed the questionnaire used by the teacher-reviewers in the original textbook program analysis. Guided by a thirty-page questionnaire, teacher-reviewers examined the instructional design of teacher's and students' editions of twelve leading elementary and secondary

science and social studies textbook programs, and related ancillary materials. Their analyses form the basis of the findings found later in this report. (See Appendix B for a list of the textbooks analyzed.)

The teacher-reviewers reported that their experience examining textbooks was valuable and urged that a shorter version of the questionnaire should be made available to other teachers. A streamlined version of the analysis tool has been reviewed by project advisors and field tested by classroom teachers.

HIGHLIGHTS OF MAJOR RECOMMENDATIONS FOR PUBLISHERS

Below, we highlight our recommendations for publishers which are further elaborated later in this report.

Phase I Getting Students Ready to Learn

Focusing Instruction

Both the teacher's edition and the student's edition should set forth clear purposes for the lesson. Teachers should be instructed to make the purpose for the lesson explicit before each assignment takes place. The student edition should also make clear what students should learn from their reading or upcoming learning activity.

New skills should build on and explicitly relate to previously learned skills and experiences. In the teacher's edition, prerequisite knowledge and skills should appear at the beginning of chapters or units, and texts should note where the previously taught information is located. Teachers should have more guidelines to informally assess students' prerequisite knowledge.

Teachers should be provided with a greater variety of suggestions for highly motivating, hands-on, concrete activities when introducing new material. These "non-reading" activities should more actively involve and prepare students for the material and, as often as possible, help them see how this information relates to the real world.

Activating Prior Knowledge

Teachers' editions, particularly at the secondary level, need to consistently have teachers tap students' prior knowledge in order to relate new information to what students already know. They should sensitize teachers to listen for students' misconceptions and provide information for clarifying them.

Textbooks should use more metadiscourse or "friendly talk", not only to help activate the reader's prior knowledge, but also to make relationships between concepts more explicit. For example: "Most of you have seen lakes and rivers..."; "Look back at the picture on the last page..."; "Have you ever flown in a plane?"

Previewing Concepts, Vocabulary, Text Structure

Teacher's editions should highlight core information, identify major themes, set priorities, and/or guide teachers to make informed decisions about choosing chapters, units, and concepts that provide a logical body of information for students. The students' editions should give students a strategy for previewing the text prior to reading.

Textbooks should highlight important vocabulary words and concepts, help teachers introduce and reinforce them, using examples and non-examples, and relate the new words to students' prior knowledge. Texts should also differentiate between high frequency words and technical vocabulary.

Publishers should improve upon the structure of information in textbooks: headings and subheadings should reflect an accurate, logical organization of subject matter; topic sentences should be obvious; connectives and referents should be clear; and graphic aids, questions, and activities should be designed to help readers organize and manage information. Teachers' editions should provide explicit information about ways teachers can help students learn about textbook structures and features.

Phase II Engaging Students in the Learning Activity

Helping Students Comprehend Information in the Textbook

Textbooks, particularly at the secondary level, should include specific instruction in active reading techniques in both the teacher's edition and the student edition. These include note taking, highlighting or underlining important information, or outlining. There should be explicit instructions for linking old and new information.

Textbooks should encourage teachers to make effective use of graphics, particularly for those children who experience reading problems and who may have difficulty attending to the print when pictures are present.

Teaching Study Strategies

Textbooks should provide explicit information to help teachers teach study skills, such as identifying text structure, chunking, mapping information, using visual imagery, test taking, and assignment completion strategies. Specifically, textbooks should provide models for developing and using effective graphic organizers and show teachers how to help students construct their own graphic organizers.

Providing Experiential Activities

Both science and social studies textbooks should provide suggestions for a wide variety of experiential activities.

Emphasizing Metacognition

Textbooks should instruct teachers and students in a variety of metacognitive skills such as questioning strategies, paraphrasing, and

error monitoring. Instruction on when, how, and why to use strategies should be well integrated into the text. Textbooks should include information for teachers about how to help their students monitor and assess their own learning.

Employing Cooperative Learning Strategies

Textbooks should encourage cooperative learning structures at both the elementary and secondary level and during all phases of learning. Activities might include group study, team reading, research, reviewing, reporting, peer teaching, and culminating projects.

Phase III Having Students Demonstrate Competence and Extend Knowledge

Having Numerous Opportunities to Demonstrate Mastery

Textbooks, particularly at the secondary level, should encourage teachers to provide students with many opportunities for active class participation. Textbooks should also encourage teachers to maximize the number of acceptable student responses.

Providing for a Variety of Ways to Demonstrate Competence

Textbook programs, particularly upper elementary and secondary, should provide a variety of activities other than written tests for students to demonstrate their learning. These could include role plays, debates, projects, experiments, and demonstrations.

Extending/Applying Learning

Textbooks should provide a rich variety of interesting activities that apply and extend new learning into meaningful contexts, suitable for a wide range of learners. They should relate to students' real world and encourage home involvement.

ORGANIZATION OF THE REMAINDER OF THIS REPORT

For each of the three phases of instruction, the report summarizes the findings of the textbook analysis by content area and grade level. These findings are based on the extensive analysis of twelve leading science and social studies textbooks completed by eight classroom teachers and verified by 40 additional teachers. In addition, we include a brief statement, based on research, that explains why the feature is important. Since changing textbooks may take several years, however, teachers may need to develop instructional strategies that make existing textbooks more usable for the diverse learners in their classrooms. Thus, each section concludes with sample activities for teachers that complement the recommendation. After each of the three phases, we present some concrete examples taken from the analyzed texts.

PHASE I GETTING STUDENTS READY TO LEARN

FOCUSING INSTRUCTION

What Is Involved

Setting a purpose
Reviewing prerequisite knowledge and skills
Motivating students

Why It Is Important

Many students learn better when frequent references are made about what is being learned, why it is important, and how it relates to other learning. While teachers can make these explicit statements, students can also benefit from reading them in their text, particularly students in upper middle school and beyond. Secondly, beginning a lesson by checking the previous day's assignment has also been demonstrated as an important instructional strategy. This strategy, when followed by a captivating demonstration, simulation, discussion, or experience can provide a powerful incentive to engage the student in anticipating the information to come, and feeling motivated to learn.

Findings

SCIENCE	
Elementary	Secondary
• Textbooks established learning goals for students relatively consistently and prepared teachers to teach to those goals.	• Most textbooks listed objectives in both the teacher and student editions and gave instructions in the front matter for using the objectives to evaluate progress.
• All textbook programs did a relatively good job of building on previous instruction in order to promote new learning. They made explicit the relationship between previously learned facts and concepts and upcoming lessons. However, there was not enough guidance for teachers to assess their students' prerequisite skills and knowledge.	• Most books did not provide enough instructional guidance--i.e. conducting pre-reading activities. One book provided information in in the front matter but teachers were not directed to it. • Most programs provided motivating, sometimes highly motivating, real world activities to introduce the lesson.

- Textbooks established learning goals for students relatively consistently and prepared teachers to teach to those goals.
- Preinstructional activities were motivating, well integrated, and frequently directly related to objectives.
- Teacher-directed demonstrations were often suggested prior to introducing new material. Such demonstratons were frequently at a level of abstraction too difficult for less able students.

SOCIAL STUDIES

Elementary

- Most textbooks did an excellent job of laying out and following manageable goals and objectives at the beginning of units and chapters. However they were not made explicit in the student edition.
- Many previewing activities were not stimulating, interesting, or varied as desired.
- Pre-reading activities could be highly motivating to students of all interests and abilities. Some teacher's editions, however, under-emphasized the importance of preparing students to learn.

Secondary

- Most teacher editions provided a list of objectives. Some skills were outlined.
- Textbooks rarely provided pre-reading activities other than a summary/overview.
- Some of the books provided motivating activities. Some activities were too time-consuming; others were not appropriate for a range of ability levels.

Textbook Recommendations

Both the teacher's edition and the student's edition should set forth clear purposes for the lesson. Teachers should be instructed to make the purpose for the lesson explicit before each assignment takes place. The student edition should also make clear what students should learn from their reading or upcoming learning activity.

New skills should build on and explicitly relate to previously learned skills and experience. In the teacher's edition, prerequisite knowledge and skills should appear at the beginning of chapters or units, and texts should note where the previously taught information is located. Teachers should have more guidelines to informally assess students' prerequisite knowledge.

Teachers should be provided with a greater variety of suggestions for highly motivating, hands on, concrete activities when introducing new material. These "non-reading" activities should more actively involve and prepare students for the material and, as often as possible, help them see how this information relates to the real world.

Teaching Suggestions (See Appendix A for detailed descriptions.)

1. Identifying objects by posing descriptive questions (See page 1)
2. Using artifacts to create an environment (See page 1)
3. Setting objectives for culminating end-of-unit activities (See page 1)

ACTIVATING PRIOR KNOWLEDGE

What Is Involved

- Tapping students' experiences, interests, and background knowledge
- Identifying students' initial conceptions
- Helping them make links between old knowledge and new information

Why It Is Important

It is the interaction of new information with old knowledge that determines what we learn. What we remember and how we interpret information comes not only from the words we see but from the knowledge we actively bring to the passage. Textbooks need to help students integrate new information with what they already know. Activities that deliberately help students activate their relevant prior knowledge will better prepare them to integrate information and generate meaning.

Findings

SCIENCE	
Elementary	Secondary
• Tapping students' prior knowledge was done inconsistently at best. • There was no guidance for assessing and correcting students' misconceptions about upcoming information.	• Other than some information in the front matter of the teacher's edition, there was little tapping or relating of prior knowledge.
SOCIAL STUDIES	
Elementary	Secondary
• Some teacher's editions suggested activities for teachers to activate prior knowledge, although there were few direct efforts in the student edition.	• The programs did not provide questions or activities to activate prior knowledge.

Textbook Recommendations

Teachers' editions, particularly at the secondary level, need to consistently have teachers tap students' prior knowledge in order to relate new information to what students already know. They should sensitize teachers to listen for students' misconceptions and provide information for clarifying them.

Textbooks should use more metadiscourse or "friendly talk", not only to help activate the reader's prior knowledge, but also to make relationships between concepts more explicit. For example: "Most of you have seen lakes and rivers..."; "Look back at the picture on the last page..."; "Have you ever flown in a plane?"

Teaching Suggestions (See Appendix A for detailed descriptions.)

4. Using writing activities to assess prior knowledge (See page 2)
5. Using simple probes to assess students' conceptions (See page 2)

PREVIEWING CONCEPTS, VOCABULARY, TEXT STRUCTURE

What Is Involved

Previewing: Concepts and topics
Vocabulary
Text structure

Why It Is Important

Children as young as fifth grade can improve their reading comprehension and memory when oriented to the textbook structure. Naturally, the better the organization and quality of the textbook writing, the more apt students are to benefit from such orientation. Because content textbooks tend to cover too many subjects in too little depth, another important part of previewing the lesson is separating the major themes and concepts from extraneous information. This is particularly true when introducing the new vocabulary words in the chapter. By using graphic organizers to highlight key concepts and show interrelationships, students can integrate new information into what they already know.

Findings

SCIENCE	
Elementary	Secondary
• Most textbooks didn't set priorities or highlight principle topics. One book did link important information to specific objectives for IEP students. • Generally, vocabulary was adequately highlighted and appropriately introduced and referenced in the lower elementary grades. Vocabulary was not developed adequately in the upper elementary grades in some texts and there were too many vocabulary words in others. • Some books were well organized but did not introduce teachers or students to the structure so that they could use it to organize information.	• There was little guidance for determining the most important information. There was more information than could be taught effectively, but there were no suggestions for reducing the density or level of difficulty. • The primary method of instruction was the introduction of vocabulary words and concepts followed by silent reading. • Information was generally well structured.

SOCIAL STUDIES	
Elementary	Secondary
• A variety of activities were used to introduce vocabulary words and concepts. Most were for the whole class, but some were identified for use with small groups or individuals. • Careful attention was paid to the organization of information. There was an attempt to avoid concept density.	• There was an enormous amount of information in these books. Occasionally there were suggestions for covering the material. Some texts made good use of summaries to introduce new material in the students' editions, but others provided no directions for using them. • The books were consistent in format and structure, but often to the point of being repetitious. • There were few graphic organizers to highlight key concepts and illustrate relationships.

Textbook Recommendations

Textbooks should highlight core information, identify major themes, set priorities, and/or guide teachers to make informed decisions about choosing chapters, units, and concepts that provide a logical body of information for students. The students' editions should give students a strategy for previewing the text prior to reading.

Textbooks should highlight important vocabulary words and concepts, help teachers introduce and reinforce them, using examples and non-examples, and relate the new words to students' prior knowledge. Texts should also differentiate between high-frequency words and technical vocabulary.

Publishers should improve upon the structure of information in textbooks: headings and subheadings should reflect an accurate, logical organization of subject matter; topic sentences should be obvious; connectives and referents should be clear; and graphic aids, questions, and activities should be designed to help readers organize and manage information. Teachers' editions should provide explicit information about ways teachers can help students learn about textbook structures and features.

Teaching Suggestions (See Appendix A for detailed descriptions.)

6. Using the two-year test to select key vocabulary and concepts (See page 4)
   Using graphic organizers to preview text structure and highlight key concepts (See page 7)
7. Searching for words in the glossary (See page 4)
8. Generating synonomous sentences to determine definitions (See page 4)
9. Having students select their own vocabulary words (See page 4)
10. Generating examples and non-examples of words and concepts (See page 4)

11.Demonstrating vocabulary words (See page 5)

** Focusing instruction

** Explicit objectives

**Tapping prior knowledge

*Manageable number of vocabulary words

**Motivation

**Metadiscourse

Unit 4 (pp 116–145)
includes the following chapters:
10 Why We Need Rules page 118
11 How Community Government Works page 125
12 Governing a Nation page 135
- TIME OUT for Standardized Tests page 146

Focus
Unit 4 focuses on the theme of power. Students will learn that communities of all sizes have governments to make and carry out rules, that different communities have different types of government, and that the people in a small community can be more directly involved in making their own rules than the people in larger communities. They will also learn about how the United States protects the rights of its citizens.

Using the Unit Opener
Have a volunteer read the opening paragraph. Then discuss what students see in the photograph. Ask: *How can you tell the children in the picture are using rules?* Ask students if they know any games that are played without rules.

Tell the class they are going to have a contest. Have ready two cotton balls and two spoons. Tell students that they will need two teams and have them decide which of the following ways of choosing teams is fair.

The Height Method. Players under a certain height form one team. Those over that height form the opposing team.

The Age Method. Players whose birthdays fall before July 1 form one team. Those with birthdays after July 1 form the other team.

Counting Off. Have players line up and count off by twos. The "Ones" and "Twos" form opposing teams.

Unit 4
Communities Need Government
Chapter 10
Why We Need Rules
Chapter 11
How Community Government Works
Chapter 12
Governing a Nation
pose you and your friends want play a game. How do you decide the rules of the game? You get together and talk about it. You agree on rules and then you play by those rules. People in communities do the same thing. They set up rules, too, and then agree to use the rules to arguments and solve
What do you think would happen if these children tried to play baseball without rules?
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The Red Method. Students wearing red are on one team. All others are on the other team.

Pulling Straws. Cut an equal number of long and short straws and have players draw without looking. Players with long straws form one team, and those with short straws form the other.

Discuss the different methods and have students tell which ones they think are fair. They should give reasons for their opinions. Say: *Being fair means giving the same treatment to everyone, or giving everyone the same chance.* Use students' chosen method to form teams.

Give each team a cotton ball and spoon and tell them to begin the game. They will quickly realize that without rules, no one knows what to do, and there cannot be a fair contest.

Now provide relay rules and have students try again. Each team should form a line. With the cotton ball on the spoon, the first player runs to a mark and back again, passing the spoon to the next player. The relay is repeated until all players have run. The first team to finish wins the race.

Discuss with students: *Why did we need rules? How can people decide the rules?* Help students realize that they had a common goal (playing a game) and that they needed rules to make it work. They may have figured out rules among themselves or asked the teacher to provide rules. They also chose a fair way to establish teams. Sum up by saying: *People work together to make decisions and to make things fair.*

Knowledge Objectives
Students will learn:
- that a newly formed community will discover that
- that people disagree over the kinds of rules that are needed.

Skill Objectives
Students will learn how to:
- make a simple map key.
- distinguish between cultural (made by people) and natural features.
- infer from the text what problem shipwrecked sailors have.
- consider rules and how they apply in different situations.

Vocabulary
vote
law

Main Idea
Communities need rules to function in an orderly way for the good of all.

Objectives
Students will learn:
- that rules are helpful and necessary for a community.
- that there are different kinds of rules.
- that rules help people get along with one another.
- that rules help people get things done more quickly, easily, and safely.
- how the Iroquois nations formed a government with a specific set of rules.

Key ** Very good
* Adequate
- Poor

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PHASE I GETTING STUDENTS READY TO LEARN

RECONSTRUCTION

All should unite in honest efforts ... hearts of war, and to restore the blessings of peace. ... AT E. LEE

STUDENT EDITION

-No objectives

*Overview

The United States faced a grave situation after Appomattox. The war for southern independence had failed, and the cost had been great. Politically, some means had to be devised to readmit the seceded states to the Union. Economically, the South had to be put back upon its feet. Socially, the question of the freed slaves had to be faced. Although the problems were clear, the methods used to deal with them remain controversial to this day.

1 Presidential Reconstruction

Northern opinion varied over the best way to deal with a defeated South. Some northerners, who believed that the war had been fought to preserve the Union, argued that the task before the country was to restore the old relationship between the North and South. President Lincoln was the leading proponent of this point of view.

There were others, however, who felt that the South should be punished. Some, like Radical Republicans Charles Sumner of Massachusetts in the Senate and Thaddeus Stevens of Pennsylvania in the House of Representatives, wanted to be certain that the South would never again think of rebelling.

Because of their strong beliefs, the Radicals wanted to control **reconstruction**, or the process of readmitting the southern states to the Union. But Lincoln saw reconstruction as chiefly a presidential task.

*Good heading

Lincoln's Plan

Lincoln had begun to consider the question of reconstruction long before the end of the war. After the North's victory seemed assured, Lincoln began thinking of ways to return the seceded states to the Union. By December 1863, he had developed a plan.

Lincoln made his plan public on December 8, 1863, when he issued his *Proclamation of Amnesty and Reconstruction*. In this proclamation, Lincoln offered **amnesty** (a general pardon) to former Confederates. In return, the Confederates would take an oath to support "the Cons... Union of the stat... and government... amnesty process, ... pardon.

Lincoln's plan ... governments form... to support the C... number was equa... the presidential el... state government... blacks, Lincoln di... did not think the ...

The Ten Percen... ty as a politician. ... creating martyrs ... fore he made his p... develop a strong ... Lincoln, who at o... many southerner... without a party t... Republican party, ... improvements, a... the Whig's logical ... in the South woul... party.

Finally, althou... slavery was implic... mention of the su... freedmen, or ... Lincoln, who for a ... of blacks, was not ... the United States. ... of blacks in the No... South handle the ...

In Congress, o... at once. The Rad... against Lincoln's ... was too lenient, a... the President co...

** Objectives in TE only

TEACHER EDITION

UNIT 1 THE NATION REUNITED

After studying this unit, the student should be abl...

1. describe the changes in post-Civil War ... life and society.
2. describe the settlement of the tr... ppi West and the close of the frontier.
3. discuss the political, cultur... al life of the Gilded Age.

OVERVIEW

Unit 1 surveys the domestic scene in the United States from Reconstruction to 1900. Chapter 1 places particular emphasis on the plight of the freedmen and attempts of northerners to insure that they did not "lose the peace." Chapter 2 describes the settlement of the last continental frontier. Chapter 3 describes the domestic politics of the late 1800's.

INTRODUCING THE UNIT

Ask students what features of American society today they are most proud of. They will probably mention such characteristics as democratic government, religious and racial toleration, and basic civil liberties. Jot these points on the chalkboard and have students record them. As the unit is studied, have students determine how these characteristics developed in the late 1800's.

CHAPTER 1 RECONSTRUCTION

After studying this chapter, the student should be able to:

1. describe the variety of reconstruction plans offered by Lincoln, Johnson, and Congress.
2. explain why Johnson's plan alienated many northerners.
3. list the various aspects of the Radical plan and explain the Radicals' motives.
4. describe the criticisms of and achievements under the Radical regimes in the South.
5. describe the restoration of "white" government in the South.

* Organizer

OVERVIEW

Chapter 1 describes the period of Reconstruction after the Civil War. Major themes include the struggle betwen the President and Congress, the motives of the Radicals, and the plight of the freedmen. The chapter is revisionist in tone, laying the blame for much of the unfortunate nature of Reconstruction on southern intransigence rather than northern vindictiveness (although the latter was certainly in evidence). The important concepts in the chapter include checks and balances, discrimination, segregation, white supremacy, terrorism, and compromise.

TEACHING IDEAS

Section 1

Introduction: Write "re... ...build" on the board. Ask students why the te... ...ruction" is so appropriate for the period being studied. Then, have them read the section.

Development: Through class discussion, have students complete a chart on the board that lists the elements of the various plans for reconstruction. Such a comparison will highlight the differences between the plans:

Lincoln	Wade-Davis	Johnson

Section 2

Introduction: This section is entitled "Restoration Under Johnson." Webster defines restoration as "a bringing back to a former position or condition" or "a reconstruction of the original form." Ask the students why the authors used that term, then have them read the section to test their hypotheses.

Development: Have the students reread the quotation from Gideon Welles on page 42. Ask them

Conceptual density

Key ** Very good
* Adequate
- Poor

- No attempt to tap readers' prior knowledge
- Doesn't review prerequisite knowledge and skills to help reader link old knowledge with new
- No motivating activities

PHASE II ENGAGING STUDENTS IN THE LEARNING ACTIVITY

HELPING STUDENTS COMPREHEND INFORMATION IN THE TEXTBOOK

What Is Involved

- Extracting relevant information from what is presented
- Integrating prior knowledge with new information

Why It Is Important

Effective instruction helps students build bridges between what is already known and new information. Approaches during this phase of instruction must encourage the student to be an active learner. They should help students make connections between old and new information by constructing and reconstructing meaning, building frameworks, and elaborating ideas. These active reading techniques can be very beneficial in helping students integrate information.

Findings

SCIENCE	
Elementary	Secondary
• These textbooks used a variety of instructional approaches to help students learn new information, but no active reading strategies such as group discussions, writing assignments, or notetaking were provided or taught. • The questioning techniques used to develop and focus student attention provided in one of the texts were considered a strength. • Teachers were directed to use only questions to determine whether students understood concepts and tasks.	• Instructional strategies did not adequately address a wide range of learning needs. Many activities were too difficult to implement without some instructional adaptation for diverse learners. • There was little attempt to teach active reading techniques. Rather, the texts promoted passive reading by relying on sustained silent reading, lectures, and presentations. • The ancillary materials did not use varied learning strategies. Some provided excellent recommendations but teachers were not directed to them.

SOCIAL STUDIES	
Elementary	Secondary
• The teacher's editions provided an extensive repertoire of instructional activities and strategies that emphasized active learning. These activities and strategies were well described, although one of the texts provided no reading strategies. • There were a number of suggestions for modifying the text for diverse learners. • There were numerous multi-sensory, multi-modal suggestions to help students integrate new information.	• There were few instructional strategies to aid students in integrating new information. One text provided reading guides but no suggestions for improving reading skills. Another had a brief section on reading strategies in the front matter of the teacher's edition. • The textbooks promoted passive learning; teacher-directed lecturing and independent silent reading were the principal instructional activities. • There were no alternative strategies or suggestions for adapting the material to meet the needs of a wide range of students.

Textbook Recommendations

Textbooks, particularly at the secondary level, should include specific instruction in active reading techniques in both the teacher edition and the student edition. These include note taking, highlighting or underlining important information, or outlining. There should be explicit instructions for linking old and new information.

Textbooks should encourage teachers to make effective use of graphics, particularly for those children who experience reading problems and who may have difficulty attending to the print when pictures are present.

Teaching Suggestions (See Appendix A for detailed descriptions)

12. Using activity guides to promote active reading and self-monitoring (See page 5)
13. Using reading road signs (See page 6)

TEACHING STUDY STRATEGIES

What Is Involved

- Direct instruction in learning strategies
- Guided practice in the use of learning strategies

Why It Is Important

There is compelling evidence that systematic strategy intervention, when applied to the content disciplines, can help students acquire better reading, writing, study, test-taking, and independent learning skills. These could include visual imaging, summarizing, mnemonics, and graphic organizers. The most effective interventions are those that students adapt to their own needs.

Findings

SCIENCE	
Elementary	Secondary
• There was a general lack of study strategies; study skills were cursory. • None of the books provided test-taking strategies.	• The texts did little to teach study skills. One book provided information on outlining and notetaking. • There was no bridge between newly introduced information and the higher level abstraction required in the ancillary materials. • There were not enough test-taking strategies.
SOCIAL STUDIES	
Elementary	Secondary
• Textbooks relied heavily on verbal questioning by the teacher to monitor student progress. • There were few good graphic organizers other than timelines. • All texts provided some skill development activities such as map and graph reading, outlining, understanding relationships, but such activities were explicit in only two of the student editions. • Two texts did not offer test-taking strategies.	• There was little instruction on important study skills. Outlining activities were included in the teacher resources from one publisher. • There were few graphic organizers other than timelines. • There was little help for improving test-taking skills.

Textbook Recommendation

Textbooks should provide explicit information to help teachers teach study skills, such as identifying text structure, chunking, mapping information, using visual imagery, test-taking, and assignment completion strategies. Specifically, textbooks should provide models for developing and using effective graphic organizers and show teachers how to help students construct their own graphic organizers.

Teaching Suggestions (See Appendix A for detailed descriptions)

14. Generative notetaking techniques (See page 6)
15. Review and test-taking techniques (See page 7)
16. Sample graphic organizers (See page 7)
17. Study guides (See page 10)

PROVIDING EXPERIENTIAL ACTIVITIES

What Is Involved

- Experiential learning
- Use of manipulatives
- Guided inquiry/discovery

Why It Is Important

Generally speaking, methods that utilize experiential, hands-on approaches are often more concrete, engaging, and enjoyable for most students. Particularly in science, the hands-on manipulative approach has been found to be the most effective method. Given a classroom of students with a wide range of abilities and interests, experiential learning activities, particularly those that tap relevant real world or day-to-day functions, can make learning meaningful and lasting. They can also help facilitate learning for those with different learning styles.

Findings

SCIENCE	
Elementary	Secondary Science
• Two of the three texts provided a variety of hands on learning experiences that appeared to stimulate and maintain interest.	• There was frequent use of hands-on activities, but were mostly for reinforcement/follow up, not to introduce new concepts or tap prior knowledge.
SOCIAL STUDIES	
Elementary	Secondary
• Two of the texts provided some hands-on activities.	• The reviewers made no mention of locating hands-on activities.

Textbook Recommendation

Both science and social studies textbooks should provide suggestions for a wide variety of experiential activities.

Teaching Suggestions (See Appendix A for detailed descriptions)

18. Using physical activity to demonstrate concepts (See page 13)
19. Making models (See page 13)

EMPHASIZING METACOGNITION

What Is Involved

- Making the learning process more explicit
- Teaching self-monitoring
- Teaching self-correcting

Why It Is Important

Many students who experience learning problems fail to employ the effective metacognitive functions necessary to monitor and appraise their academic and social situations. Metacognitive skills enable students to independently regulate and self-correct their performance. Without an awareness of their own performance, students have difficulty altering and improving both their skills and behavior.

Findings

SCIENCE	
Elementary	Secondary
• One textbook provided some guidance for teachers to help students monitor their work. • Teachers were directed to ask questions to monitor learning but there were no reteaching and few alternative suggestions.	• There were self-monitoring questions in the student editions from one publisher.
SOCIAL STUDIES	
Elementary	Secondary
• There was not enough guidance to help students develop their own monitoring strategies, although teachers thought one text provided good suggestions.	• There were few suggestions for improving metacognitive skills.

Textbook Recommendations

Textbooks should instruct teachers and students in a variety of metacognitive skills such as questioning strategies, paraphrasing, and error monitoring. Instruction on when, how, and why to use strategies should be well integrated into the text. Textbooks should include information for teachers about how to help their students monitor and assess their own learning.

Teaching Suggestions (See Appendix A for detailed descriptions)

20. Paraphrasing strategy (See page 14)
21. Inserting visual cues in important information (See page 14)
22. Learning logs (See page 14)

23. Self-questioning techniques (See page 14)

EMPLOYING COOPERATIVE LEARNING STRATEGIES

What Is Involved

- Small group learning
- Common goals within groups
- Individual accountability

Why It Is Important

Students grouped in cooperative learning structures, where they work together toward a common goal, have been found to gain self esteem, have a more positive self attitude, work more effectively in groups with a positive sense of group responsibility, have a more positive school attitude, and experience increased academic achievement.

Findings

SCIENCE	
Elementary	Secondary
• Only one of the texts fostered cooperative learning strategies.	• Teacher-reviewers reported no findings.
SOCIAL STUDIES	
Elementary	Secondary
• Two of the texts fostered cooperative learning strategies.	• Teacher-reviewers reported no findings.

Textbook Recommendation

Textbooks should encourage cooperative learning structures at both the elementary and secondary level and during all phases of learning. Activities might include group study, team reading, reviewing, research, reporting, peer teaching, and culminating projects.

Teaching Suggestions (See Appendix A for detailed descriptions)

24. Reviewing (See page 16)
25. Peer teaching (See page 16)
26. Team reading (See page 16)
27. Cooperative learning teams, games, tournaments (See page 17)

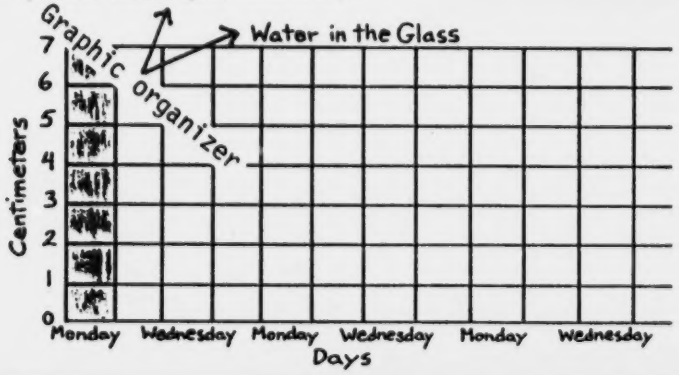
PHASE II ENGAGING STUDENTS IN THE LEARNING ACTIVITY

ACTIVITY

Let's measure the change from water to water vapor. You will need a glass, a metric ruler, a marking pencil, some water, and some tape.

Tape the ruler onto the outside of the glass. Make a mark on the glass at seven centimeters. Fill the glass with water up to that mark. Put the glass in a warm place.

Two times each week measure the water that is left in the glass. Keep a record like this. When do you think all the water in the glass will become water vapor? Answer will vary.



Graphic organizer

101

Common misconception that any child could have--this activity is good for all students.

** Hands-on

104 II INVESTIGATING THE EARTH AND THE UNIVERSE

4. ACTIVITY — *Drops and Cool Glasses*

Materials: 2 glasses, ice, water, cloth

a. Have the children read the first two paragraphs and look at the picture on page 104. Make sure they understand how to set up the activity. Distribute the necessary materials to each group. Have them follow the directions. Be sure that they put plenty of ice in the second glass.

b. Have the children read the third paragraph. Have them follow the directions and answer the questions. Discuss the questions and answers with the whole class.

c. Ask the children where they think the dew on the outside of the glass came from. Any answer is acceptable at this time.

Special Needs

If special-needs children think that the water passes through the glass, add food coloring to the water in the glass. Children will then observe that the water condensing on the glass is not the same color as the water inside.

5. Tell the children to read the first paragraph on page 105 and look at the top photograph. Discuss with them possible answers to the questions. During the discussion accept a variety of answers. Make sure the children understand that the water drops form on the outside of the glass only because it is cooler than the air.

6. Have the children look at the picture on the bottom of page 105 and read the second paragraph. Discuss the questions with them.

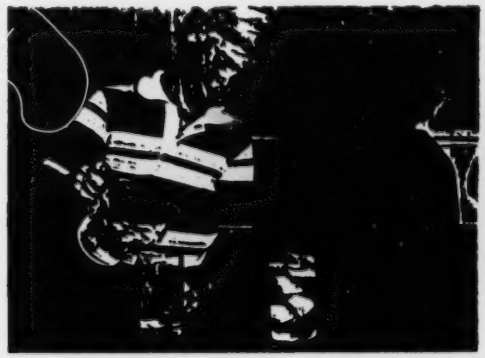
7. Ask the children to compare the formation of dew with the disappearance of a puddle. (When dew is formed, water vapor in the air — a gas — is changed to liquid water. When a puddle disappears, liquid water is changed to water vapor in the air — a gas. They are opposite processes.) Stress that the first process occurs when there is a loss of heat energy and the second process occurs when there is an increase in heat energy.

8. Ask the children what will happen to the water on the glass if the glass remains on a table for several hours. (The water will evaporate.) Ask what will happen to the water inside the glass. (It will become warmer.)

ACTIVITY

To find out where dew comes from, you will need two glasses, ice, water, and a cloth.

Take two empty glasses. Wash and dry the outside of each one. Fill one glass almost full with warm water. Fill the second glass almost full with ice and cool water.



Place the glasses near each other. Watch the outside of each glass. What do you see? Touch the outside of the cold glass with your finger. How does it feel? Do you feel the same thing on the other glass? How are the two glasses different?

wet and cool

no

Glass with warm water is warmer and drier.

105

** Thoughtful questions

* With instruction, these could be used for self-monitoring

Key ** Very good
* Adequate
\- Poor

* Instruction in using text structure

FOCUS Skills

Comparing and Contrasting

You compare and contrast both things and events quite often. For instance, when you select the courses you wish to take, you read the description of each course. You consider the factors that the courses have in common. You are comparing the courses. Perhaps all the courses are required and each is worth one credit toward graduation. Each course, however, has its unique qualities. When you consider differences between the courses, you are contrasting them.

Comparing and contrasting are essential processes for scientists. For example, when scientists are studying matter, they may compare or contrast the properties of different types of matter. The following table compares and contrasts homogeneous and heterogeneous mixtures.

* Graphic organizer

	Homogeneous	Heterogeneous
Differences (Contrasting)	Composition is the same throughout. Contains two or more materials distributed evenly throughout one another. It is a solution.	Varies in composition Contains two or more materials, but not evenly distributed Is not a solution
Similarities (Comparing)	Both are matter. Both have mass and exhibit inertia. Both may contain solids, liquids, or gases. Both are made of atoms.	

Read Section 5:6, Physical Prope[illegible]. What is a physical property? Can you use physical properties as your basis for comparing and contrasting matter? You do this every day without even realizing it. Would you wear a heavy coat or a light jacket on a 0° Celsius day? You consider the physical properties of materials when choosing clothing that is most suitable for the weather conditions.

*Metadiscourse

Use physical properties to compare and contrast the following pairs of matter.

Ice	Water vapor
Milk	Soda
An orange	A baseball
Lead	Iron
A bat	A tennis racquet
A tire	A rubber band

Taps prior knowledge

Copy the following table on a sheet of paper. Complete the copied table to compare and contrast the properties of aluminum and silver.

	Aluminum	Silver
Color		
Luster		
Density		
Malleability		
Metal or nonmetal		
Electrical conductivity		
Chemical reactivity		

5. Identify the metal in the unknown that your teacher gives you.

Key ** Very good
* Adequate
- Poor

118

37

Identifying Metal Ions

[illegible] can you identify the [illegible]al in a sulfide?

Data and Observations

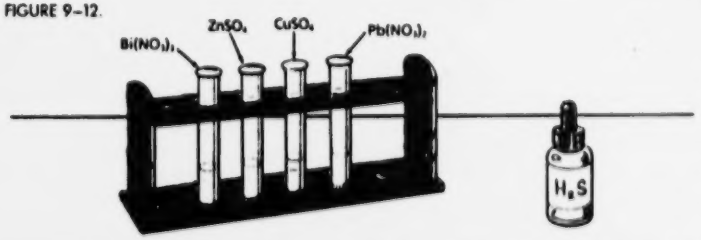
Sample data

Test tube	Observations	Metal
$Bi(NO_3)_3$ 1	brown	bismuth
$ZnSO_4$ 2	white	zinc
$Pb(NO_3)_2$ 3	black	lead
$CuSO_4$ 4	black	copper
Unknown	Answers will vary.	

Questions and Conclusions

1. Table 9–4 lists the colors of various metal sulfides. Use this table to determine what metal is present in each test tube.
2. Uncover the test tube labels. Check your results against the labels.
3. You are given an unknown solution. After you add hydrogen sulfide solution, you observe the formation of a yellow substance. What metal ion was present in the unknown solution?
4. How can you identify a metal in a sulfide?

FIGURE 9–12.



204

9:9 Selenium and Tellurium

Selenium can be found in deposits of free sulfur. It is also an impurity in sulfides and in copper ore. Most selenium is obtained as a by-product in the electrolysis of copper ore [illegible]duce cop-per. Like sulfur, selenium exists in several allo[illegible] Two of these, crystalline red and crystalline gray, as[illegible] metallic gray, is a metal.

Selenium is a poison. Insects that feed on plants are oft[illegible] with selenium. Small amounts of selenium insecticide are put on the soil or sprayed on plant leaves. The selenium passes through the entire plant without harming it. However, insects eating the plant are poisoned.

Selenium has some metallic properties such as conducting an electric current. In the dark, selenium is a poor conductor. However, when it is exposed to light, selenium gives up electrons and becomes a good conductor. For this reason, selenium is called a **photoconductor**. The ability of a photoconductor to pass along electrons is controlled by light. The brighter the light, the more electrons.

Photoconductors make up the photocells used in photographic light meters and in "electric eye" cameras that automatically adjust to light intensity. Selenium photocells are also used in counting people as they enter buildings and for setting off burglar alarms.

When added to glass, selenium counteracts the green color due to iron impurities. If a large amount of selenium is used, the glass becomes red. This red glass is used in traffic lights.

Metacognition Could be improved if student ask, Do I really understand.

What is a photoconductor?

How clear is this answer?

1. [illegible]
2. Give two uses for selenium.

** Good self-questioning

a b

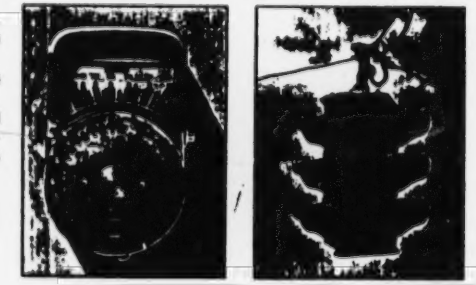


FIGURE 9–13. Selenium is used in light meters (a) because it is a photoconductor. The red glass in traffic lights (b) contains selenium.

38

PHASE III HAVING STUDENTS DEMONSTRATE COMPETENCE AND EXTEND KNOWLEDGE

HAVING NUMEROUS OPPORTUNITIES TO DEMONSTRATE MASTERY

What Is Involved

- Setting up numerous situations where students can experience success
- Using mistakes as instructional opportunities

Why It Is Important

Effective instruction gives students opportunties for more success than failure and moves students from a passive role to an active one. This sometime difficult task can be accomplished by eliciting as many correct responses as possible from individual students, anticipating and preventing incorrect responses, allowing mistakes to be "OK" and instructional, and finally, repeating and reteaching when responses are hesitant.

Findings

SCIENCE	
Elementary	Secondary
• Some of the books directed teachers to maximize the number of correct responses.	• Teacher-reviewers reported no findings.
SOCIAL STUDIES	
Elementary	Secondary
• One text encouraged maximizing the number of correct responses; one provided some direction for positive reinforcement.	• Teacher-reviewers reported no findings.

Textbook Recommendations

Textbooks, particularly at the secondary level, should encourage teachers to provide students with many opportunities for active class participation. Textbooks should also encourage teachers to maximize the number of acceptable student responses.

Teaching Suggestions (See Appendix A for detailed descriptions)

28. Questioning techniques (See page 17)

PROVIDING FOR A VARIETY OF WAYS TO DEMONSTRATE COMPETENCE

What Is Involved

- Acknowledging a diversity in students' strengths and interests
- Accommodating diverse learning styles

Why It Is Important

Students should be allowed to demonstrate knowledge and mastery other than through written tests. Evaluation exercises should also inspire students to engage in a series of problem solving steps rather than require students to memorize and recall trivial details. Because students have diverse learning styles, strengths, and interests, accommodating their individuality can set the stage for more successes and therefore more enjoyment of learning.

Findings

SCIENCE	
Elementary	Secondary
• Most evaluation activities required writing, although some teachers reported good hands-on demonstration of competence in some texts. • None of the texts provided enough evaluation activities to help identify students' knowledge or skill competence.	• There were few alternatives to paper and pencil assessment. • There were no evaluation strategies targeted for different types of learners.
SOCIAL STUDIES	
Elementary	Secondary
• There was little guidance for linking evaluation results to reinforcement and enrichment activities or to improve instruction. • Many evaluation activities were written at a higher level of difficulty than the text or workbooks.	• The texts provided some useful reteaching strategies. One publisher provided page numbers of previous lessons for reteaching or reviewing but no reteaching suggestions. • There were few reinforcement activities. • There was little direction for using post-instructional activities. • There were few strategies for adapting assessment material to diverse learners.

Textbook Recommendation

Textbook programs, particularly upper elementary and secondary, should provide a variety of activities other than written tests for students to demonstrate their learning. These could include role plays, debates, projects, experiments, and demonstrations.

Teaching Suggestions (See Appendix A for detailed descriptions)

29. Student designed reviews and tests (See page 19)
30. Alternative testing techniques (See page 20)
    See also Extending/Applying Learning (See page 20)

EXTENDING/APPLYING LEARNING

What Is Involved

- Applying and generalizing skills
- Providing opportunities for creative, independent thinking

Why It Is Important

Extension or enrichment activities help all students transfer, apply, and generalize new knowledge, and should not be reserved for the above average student. Approaches to extend and apply learning are not limited to activities in the individual classroom, but rather seek ways to build bridges with other instructional settings and relevant non-school activities.

Findings

SCIENCE	
Elementary	Secondary
• Enrichment activities were geared to the most successful students. Those for students with learning problems were boring or nonsubstantive. • There was little guidance for adapting post-instructional activities for a wide range of students.	• Teacher-reviewers reported no findings.

SOCIAL STUDIES	
Elementary	Secondary
• Teacher-reviewers reported no findings.	• Teacher-reviewers reported no findings.

Textbook Recommendation

Textbooks should provide a rich variety of interesting activities that apply and extend new learning into meaningful contexts suitable for a wide range of learners. They should relate to students' real world and encourage home involvement.

Teaching Suggestions (See Appendix A for detailed descriptions)

31. Role plays, debates/interviews, letter/diaries, newspapers (See page 20)

PHASE III HAVING STUDENTS DEMONSTRATE AND EXTEND KNOWLEDGE

Key ** Very good
* Adequate
- Poor

* Section review

cess alone did not involve restraint
e trade. A monopoly itself was not
Court stated. It became illegal only
ved to restrain interstate trade.
d other decisions by the Supreme
nced businesses that they were free
ate. Thus the movement to form
nsolidations actually speeded up in
fter the Sherman Antitrust Act was
ne historians see in this develop-
nce that the act was not really a
asure. Such historians instead
act as an effort by big business to
growth of organized labor.
its glaring weakness, the Sherman
Act was an attempt by the federal
t to make rules for the conduct of
s. It established an important prec-
ter and more effective laws.

mpanies. After 1890 some of the
siness leaders abandoned the trust
form of business consolidation – the
mpany. To form a holding company,
essary to get a charter from one of
The directors of the holding com-
ssued stock in the holding company
the money raised by selling this
directors bought controlling shares
wo or more corporations that we
gaged in producing goods or
as manufacturing compar
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actions becau
der a chart

through interlocking directorates or through secret understandings – were subject to prosecution under the Sherman Antitrust Act. However, it was difficult to prove that a monopoly existed. It was especially difficult when the monopoly had been created by means of interlocking directorates and secret agreements.

SECTION REVIEW

See underscored items, text pp. 521-22.

Identify: individual proprietorship, partnership, corporation, stock, dividend, combination, monopoly, Sherman Antitrust Act

For answers to questions, see Answer Key, pp. A73-74

1. **Interpreting Ideas:** What advantages does the corporation have over the partnership as a method of business organization?
2. **Summarizing Ideas:** (a) What are the provisions of the Sherman Antitrust Act of 1890? (b) Why was this law difficult to enforce?
3. **Analyzing Ideas:** How did the Supreme Court decisions in the late 1800's aid big business?
4. **Studying Graphics:** Make a chart entitled "Forms of Business Combinations" with four columns headed Pools, Trusts, Holding Companies, and Interlocking Directorates. Below each heading (a) define this form of business consolidation, (b) give reasons for its creation, (c) name objections to it, and (d) name methods used to control its abuses.

**Graphic organizer

4 Business pioneers give new directions to American life

See Teaching Suggestions in TMRG, p. TM131.

The people who presided over the new world of throbbing machines, noisy factories, and

4. See the following chart. Answers will vary.

Forms of Business Combination

	(a) Definition	(b) Reasons for Creation	(c) Objections	(d) G
Pools	Informal organizations for agreement among corporations	To divide business among several corporations	Eliminated competition Fixed rates and prices	Decla inte in 1887
Trusts	Business organizations that granted trust certificates in exchange for stock	To run several corporations as a giant business organization, to secure monopoly control	Raised prices, closed out small businesses	Sherman Antitrust Act of 1890
Holding Companies	Chartered corporations formed in order to buy controlling stock in other companies	To form great business combinations	Could also monopolize industry	Charter could be revoked under Sherman Antitrust Act
Interlocking Directorates	Groups of persons who served as directors for more than one corporation	To establish uniform policies for an entire industry	Could create monopolies	Prosecution under Sherman Antitrust Act

43

530

22 SUMMARY

By the opening years of the 1900's, the United States had become the leading industrial nation in the world. Smoking factory chimneys, rumbling machinery, and long trains of freight cars pulling into and out of congested urban centers symbolized the industrial world.

In the Northeast and Middl
the nation, industrialism was t
materials from America's vast
mills and factories. Finished pr
from the factories into the mar
Mass production led to spec
build the railroads and the fac
methods of producing goods. M
advertising and selling. Many
factory workers, and others—a
methods of business organizati
corporations and combinations
the individual or family-owned
form of business organization.

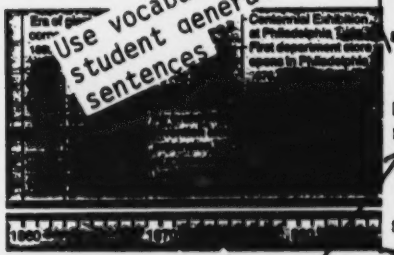
Throughout America a new
faster and faster pace. It was a
nation's history, but some of th

CONNECTING CHAPTER ID

Much of the nati
Americans
indust
chal
their proble

*Alternative way to demonstrate mastery

Use vocabulary in student generated sentences



Written answers or class discussion?

* Chapter reviews

22 REVIEW

Reviewing Important Terms

In the sentences below, the underlined terms are incorrect. On a separate sheet of paper, rewrite each sentence using the correct term.

1. The specialty store sold a variety of different products under one roof.
2. Zinc and lead are the raw materials needed to produce steel.
3. A monopoly is an organization that owns all of the stock in many companies.
4. To raise capital to carry on business, individual proprietorships sold stock.
5. To form a charter, several corporations agree to divide business opportunities among themselves.
6. The Bessemer process was important to the production of high quality kerosene.
7. Rural centers have the following characteristics: factories, efficient transportation and communication, and a population greater than 2,500.
8. The merger of 11 steel companies to form the United States Steel Corporation marked the beginning of industrial capitalism.

Practicing Critical Thinking Skills

1. Interpreting Ideas. (a) How were industrialization, transportation, and the growth of cities in America interrelated? (b) How did the abundance of natural resources and the development of advanced technology in America help contribute to its rapid growth as an industrial power?
2. Organizing Ideas. (a) List the discoveries or inventions between 1865 and 1900 that you think did the most to encourage America's industrial growth. (b) How did each affect the growth of industry? (c) Were any of them interdependent? Explain.
3. Analyzing Viewpoints. (a) How do you suppose J. P. Morgan felt about the passage of the Sherman Antitrust Act? (b) What arguments might he have made to support his position?
4. Evaluating Ideas. (a) Describe how Vanderbilt, Carnegie, or Rockefeller rose "from rags to riches." (b) Were their methods legal? Acceptable? Explain. (c) Is it likely that a person today could rise "from rags to riches" as the industrialists did in the late 1800's? Why or why not?
5. Relating Past to Present. (a) Should industries in the United States bear responsibility for what happens to the environment as a result of their activities? Why or why not? (b) How do the environmental efforts of government, business, and private groups today compare with those of the late 1800's? (c) How would you penalize those corporations who carelessly disregard environmental concerns?

Developing History Study Skills

1. Interpreting Economic Statistics. Review the charts on page 522 of the textbook. (a) How much raw steel was produced in 1900? (b) How much more crude petroleum was produced in 1900 than in 1870? (c) Based on these charts, what inferences can you make about United States industrial production from 1870 to 1900?
2. Making Inferences. Look at the pictures in this chapter that show scenes of nineteenth century life and industry. (a) Use the information in these illustrations to formulate at least five inferences about transportation, building materials, and sources of energy in the late nineteenth century. (b) Compare your inferences with what you have read. Cite evidence to evaluate your inferences as accurate, inaccurate, or incomplete.

Relating Geography and History

The United States had the many natural resources necessary to industrialize. Industrial expansion and improvements in transportation changed the nation. To better understand the connection between natural resources and the growth of industry, study the map of mineral resources on pages 1020–21 and answer the following questions.

1. (a) In which states east of the Great Plains was iron ore discovered? (b) In which states east of the Great Plains would you expect the steel industry to develop? Why? (c) Iron ore from the Mesabi Range in Minnesota was used in the Pittsburgh steel mills. Along what route would the ore be most easily transported? Why?
2. (a) Explain the importance of the location and accessibility of raw materials in determining the location of an industry. (b) What are some other factors to be considered in locating a factory?
3. The steel industry and railroads depended on each other for many things. (a) How did the two industries help each other? (b) How did each affect the growth of cities?

44

531

PHASE III HAVING STUDENTS DEMONSTRATE AND EXTEND KNOWLEDGE

Reviewing Main Ideas
Possible answers:
1. a. wagon trains from Independence, Missouri
   b. long, slow, dangerous trip
2. a. present-day Oregon, Washington, Idaho, parts of Montana
   b. from 1843 to 1845, about 5,000 Americans to Oregon
3. a. seeking place to worship freely
   b. settled valley of Great Salt Lake in 1847
4. a. land grants from Mexico to Stephen Austin and others
   b. troubles with Mexico
5. a. 187 Texans inside
   b. Mexicans kill all 187
6. a. start of Mexican War
   b. battle for Mexico City
7. a. Mexico gives half its land to U.S.
   b. U.S. pays Mexico $15 million
8. a. John Marshall finds gold at Sutters Mill
   b. rush of people from Eastern U.S., Europe, Asia, South America to California in 1849

In Your Own Words
Sample paragraphs:
We Americans think the Mexican government is wrong to say we must give up our slaves and that no more Americans can come to live in Texas. What's more, the Mexican government at first wanted as many Americans as they could get into Texas. Now they're afraid we'll take over. As for President Santa Anna, he had no right to make himself president for life. We should have some say about this.

We Mexicans say the Americans broke our law when they brought slaves here. In addition, our government is right to keep other Americans from coming to Texas. After all, Texas belongs to Mexico.

Take Another Look
- a. gave much information about northwestern Louisiana Territory
- l. proved it possible to move upstream as easily as downstream
- j. gave much information about southwestern Louisiana Territory
- k. first national highway
- f. makes New York City trading center of U.S.
- d. first frontier president
- m. later became part of U.S.; led to war with Mexico
- h. most of the Indians in the country now lived west of Mississippi
- c. adds more land to U.S.; slavery spreads farther west; danger of war with Mexico
- e. U.S. adds what is now Oregon, Washington, Idaho, parts of Montana
- i. U.S. adds present-day California, Utah, Arizona, Nevada, parts of Colorado, Wyoming
- g. gave U.S. claim to what is now state of Utah
- b. rapid population growth makes California a state in 1850

Key ** Very good
* Adequate
\- Poor

** Applying knowledge

** Organizer to sequence events

Chapter Review

1. fastest ship at time
2. cause of sudden growth

Words to Know

1. Why was boarding a *clipper* a good way of getting to California?
2. How can a *gold rush* lead to a *boom*?

Reviewing Main Ideas See above.

Below is a list of important events from the chapter. Find two facts from the chapter that describe each event.

1. In the 1840's, many Americans decide to move west of the Mississippi. (page 258)
2. The United States encourages people to settle Oregon. (page 260)
3. Mormons settle in Utah. (pages 260–261)
4. Americans settle in Texas. (pages 263–264)
5. Santa Anna attacks the Alamo. (page 264)
6. President Polk orders General Taylor to cross the Nueces River. (page 265)
7. In 1848, the United States and Mexico sign a peace treaty. (pages 265–266)
8. News of gold found in California spreads. (pages 267–269)

In Your Own Words See above.

During the 1830's, Americans in Texas quarrelled with [illegible] government. Write a [illegible] the reasons [illegible] from the American [illegible] write another paragraph [illegible] the Mexican side.

Keeping Skills Sharp

1. People moving west in the 1830's and 1840's traveled over many different routes. Make a map showing the routes people took to Oregon, Utah, and California. Be sure your map has a title and legend. See maps, pages 252, 267.
2. Draw a map of the United States. Do not include Alaska and Hawaii. On the map, show the territories the United States gained in the following years: 1803, 1845, 1848, and 1853. Be sure your map has a title and legend. See map, page 266.

Challenge! *Critical Thinking:* Evaluation, Decision Making

Suppose the year is 1840 and you and your family are getting ready to join a wagon train bound for Oregon. What supplies should you take with you? Make detailed lists of the food, clothing, weapons, household goods, farm equipment, and animals you will need. Do not forget it all has to fit in your wagon. See drawing, page 250.

Things to Do

1. Write an article that might have appeared in newspapers of the day telling about one of the following events: war begins between the United States and Mexico, the Mormons change the desert, gold is discovered in California, a trip on the Oregon Trail.
2. Make a poster urging people to join a wagon train headed west. Use words that will make people eager to come.

** Non-traditional evaluation

** Various ways to demonstrate competence

Unit Review

Take Another Look See above.

Below is a list of key events from the unit. On a separate sheet of paper, place the events in the order in which they occurred. Then tell why each was important to the country.

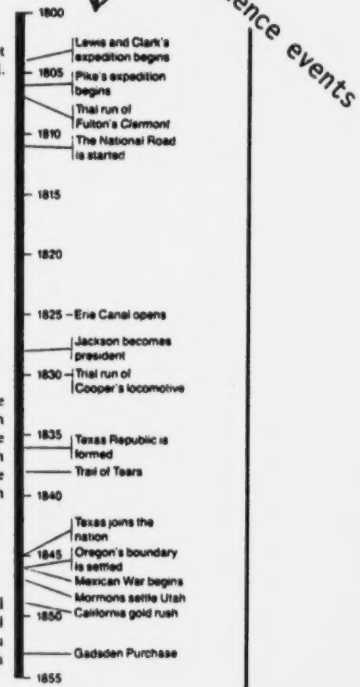
a. Lewis and Clark expedition begins.
b. California gold rush begins.
c. Texas joins the nation.
d. Jackson is elected president.
e. Oregon's boundary is settled.
f. The Erie Canal opens.
g. Mormons settle Utah.
h. The Cherokee take the Trail of Tears.
i. The United States and Mexico fight a war.
j. Pike explores the Southwest.
k. The National Road is started.
l. The first steamboat makes its way up the Hudson River.
m. Texas becomes a republic.

You and the Past

As people from the United States came into contact with people from the Spanish colonies and later from Mexico, many Spanish words found their way into the English language. In fact, the English that Americans speak has borrowed more words from Spanish than from any other language. Below are a few of those words. Try to explain how they became a part of the English language.

adobe	rodeo	corral	ranch
alligator	breeze	buffalo	canyon
mosquito	patio	pronto	tornado

See how many other words you can find that were borrowed from the Spanish language. Then study the map of the United States in the Atlas. How many Spanish place names can you find on the map? (Clue: Six states have names that come from Spanish.) California, Colorado, Florida, Montana, Nevada, Texas



** Extending knowledge

APPENDIX A

TEACHING SUGGESTIONS

TEACHING SUGGESTIONS

PHASE I GETTING STUDENTS READY TO LEARN

Focusing Instruction

1. Object identification by posing descriptive questions

Tell the class that you have an object to show and that they may ask any question about it as long as you can answer yes or no. Help them define what might be important to know in order to identify the object. Accept and record all answers, eliminate some as more information is gathered. This involves the whole class and encourages passive learners to participate in a non-threatening way.

2. Using artifacts to create an environment

When starting a new unit, try to fill the classroom with an assortment of pictures, models, posters, mobiles, and projects that relate to the unit to create an element of surprise when students come into the room. The more dramatic the materials, the greater the interest in starting the new unit.

For example, to introduce a unit on the Geologic Time Scale, fill the room with models, posters, and pictures of prehistoric animals (Edmonds Scientific sells eight foot cardboard models). The models are placed in the center of the room with the desks outside them. With the lights out, shades down, and spotlights on the dinosaurs, the room is ready. The excitement that is created when the class reports can be channeled and used through the whole unit. And with a little luck and a lot of vigilance, the dinosaurs will survive to appear again the next year.

3. Setting objectives for culminating end-of-unit activities

The object of motivational goal-setting is not just to learn a lesson, concept, historical era, or map skills, but to set a goal that can be reached or facilitated by learning the lesson. For example, the textbook says we are going to learn the story of the U.S. Constitution. What we are really going to learn about is a miracle. The teacher asks what a miracle is and directs students to watch for its occurence during the unit. The miracle was that so many people could agree on one thing. Students may find other miracles along the way.

Another technique is to explain to students that at the end of the unit they will have an opportunity to design a creative invention that, if invented at the time, would have changed history.

Sometimes construction of a product at the end of a unit might be the goal--for example, a timeline, a diorama, or a play. If the goal is identified at the beginning, there is a bit more motivation to learn.

Activating Prior Knowledge

4. Using writing activities to assess prior knowledge and identify misconceptions

a. To assess prior knowledge, increase self-esteem, and encourage growth and self-monitoring, pass a sheet of paper along in small groups of students and have each student write one fact about a given topic. No fact can be repeated. The group scores one point for each correct fact. The paper may be exchanged with other groups until the topic has been exhausted or a time limit reached.

The activity can be repeated while students read and again after all reading has been completed. Score each time to note improvement. Be sure to discuss any misinformation as the instruction is given. Group improvement can be rewarded with points, stars, or free time.

b. Choose a word or phrase related to an upcoming topic and ask students to take three minutes (five minutes for older students) and write everything that comes into their head when they see or hear the word or phrase. Students could share their entries or the teacher could read and comment on different strategies, perspectives, relationships, or comparisons noted in student work. Teachers can pick up on students' misconceptions. The writing is not graded or checked for spelling or grammar. As above, the activity can be repeated at the end of the chapter and students can compare their second attempt with their first.

c. The teacher creates a pretest based on common misconceptions about the topic to be studied. Students are told that this pretest does not count as a grade. For example, if the topic is the American cowboy on the Great Plains between 1860 and 1890, the true-false statements could include:

Many cowboys were black. (true)
Most cowboys carried guns. (false)
Cowboys spent lots of time repairing fences. (false)

Many students will answer incorrectly. The teacher can then use these incorrect responses as a motivator and a rationale for the study of the American cowboy.

d. The teacher could also follow each true/false statement with two columns for responses. Students use the first column to record their answers before reading the assignment. They complete the exercise a second time after reading. This can be used to build students' skill in self-monitoring.

5. Using simple probes to assess students' conceptions

a. Conceptual probe: a set of opened-ended questions administered to a class in advance of teaching to identify present "concepts-in-place" in the students' thinking.

b. Pretest: A multiple choice, justified choice, or short essay instrument to identify present knowledge of facts, vocabulary, concepts, and, to some degree, processes, and to provide a base for assessing growth.

c. Interim formative tests, multiple choice, justified choice, or short essay and/or performance assessments, given at intervals during teaching to monitor acquisition of new concepts and processes. Alternatively, this could take the form of an embedded assessment (see below).

d. Embedded assessment: A learning experience that has been identified as also giving evidence of the acquisition of the desired objective, such as completing an experiment satisfactorily or following directions successfully.

e. Performance assessment: An assessment, using equipment, whereby the pupil can demonstrate skills and competencies acquired, in an experimental or laboratory situation.

f. Summative assessment: A final set of experiences and/or questions to measure the acquisition of the objectives of the lesson as a whole.

Example of evaluating students' responses to questions

Question: Where do plants get their food?

Student responses:

Score	Essentials
0	No attempt made to answer questions
1	"Food from soil" - no reference to sun, green leaves, or types of raw materials obtained from soil
2	"Takes in food/fertilizer through roots" - explanation implies plant absorbs and utilizes organic foods as animals do
3	"Takes in water and raw materials through roots, needs sunlight" - no mention of manufacturing food in leaves, or need for carbon dioxide
4	"Makes its own food, in the leaves, needs sunlight, and raw materials, water from soil, carbon dioxide from the air" - may add "respires" or "gives off oxygen"
5	"Uses chlorophyll in the leaves to make its own food from carbon dioxide, which is taken in through the leaves, and from water that is taken in through the roots. It needs sun or light."

Probably a 3-4th grade child will not have all these elements of photosynthesis. The important ones to look for are: THAT THE PLANT PRODUCES OR MANUFACTURES ITS OWN FOOD; needs green leaves (may or may not mention chlorophyll); and uses water from soil BUT DOES NOT TAKE ORGANIC FOOD FROM SOIL.

It is important that the misconception of "eating," or absorbing organic food from soil, be surfaced, and then that exercises gradually elicit contradictions to that position. This creates the teachable moment to begin

to develop a different theory. The mechanisms of plant respiration can be left for high grade levels unless questions emerge naturally.

Previewing

6. Using the two-year test to select key vocabulary words and concepts (Archer 1987)

To help you determine what vocabulary words or concepts deserve the most class attention, given them the two-year test. Ask yourself if students will still need to know and use the word or understand the concept in two years. If the answer is yes, spend the necessary time to develop an understanding of the word or concept. If the answer is no, give it less attention. For example, lava is a word used more commonly than the word magma, the graduated income tax is a more relevant concept that the gold standard.

7. Searching for words in the glossary

The teacher selects a word at random from a list of important and key words that students are given from the material to be studied. After students pronounce a word, they locate it in the glossary of their text. As students find the word, they give a thumbs up sign. If a child is having difficulty finding the word, a neighbor may give hints by saying, "You are getting hot (or cold)." Some children may need to be given the page number or clearer hints.

Once everyone has found the word, one student is called on to give the pronunciation and meaning. Then the class locates the word in the text. New words can be listed on index cards or in vocabulary books.

8. Generating synonomous sentences to determine the definitions

When introducing new vocabulary words, the teacher models the word by using it in several sentences. The students are then asked to think of other sentences that use the word and to share them with their classroom neighbors.

9. Having students select their own vocabulary words

The teacher asks students to skim the text for five to ten words not used in their everyday language. Students transcribe the words onto cards, locate their definitions in a dictionary, and copy the definition appropriate for its context on the cards.

As students give their word, their definition, and an example, the teacher writes the word on the board. Other students who chose the same word verify the appropriateness of the definition and give their example. The class comes to consensus on the meaning using their everyday language.

10. Generating examples and non-examples of words and concepts

Students can give examples and non-examples of vocabulary words and concepts after the definitions are understood. Examples for the term civil rights could include: the right to serve on a jury; the right to a fair trial; the

right to bail. Non-examples could include: no trial; no right to bear arms; no free speech.

11. Demonstrating vocabulary words

Many words used in science can be demonstrated by the teacher before the students encounter them in the text. For example, while actually doing the demonstrations, say aloud, "I add sugar, the solute, to water, the solvent, and by stirring, the sugar is made to dissolve and form a solution. If more sugar is added until no more solute will dissolve in the solvent, the solution is said to be saturated. Because a large amount of sugar can be dissolved, the solution is said to be concentrated." After the demonstration, the sentences are written on the board with the vocabulary words highlighted.

PHASE II READING/LEARNING FROM THE TEXTBOOK PROGRAM

Reading Skills

12. Using activity guides to promote active reading and self-monitoring

One method for promoting active reading and self-monitoring is the textbook activity guide or TAG (Davy, 1986). The teacher selects the most significant concepts in a difficult portion of the text and determines the most effective way to convey the information. It may be a graphic organizer, outline, or discussion between several students. The teacher then designs a guide that reflects his/her goals for the text and is appropriate for the majority of students in the classroom. A strategy code and self monitoring code is developed to assist students in self-monitoring. The strategy codes could be:

RR Read and retell in your own words, taking turns with a partner

PP Predict with your partner

WR Provide a written response on your own and compare with a partner

MOC Develop a map (graphic organizer) or outline or chart with a partner

The self-monitoring codes could be:

___ I understood this information

? I'm not certain if I understand

X I do not understand and I need to restudy

The teacher explains and models how to use the codes and walks the students through the TAG guide, discussing the importance of varying one's reading rate and how and when to use strategies. Students should be paired with someone who is slightly more proficient in reading. Monitor progress, discuss the guide questions, and help students become aware of how these strategies should be internalized and applied to other settings.

13. Using reading road signs

Some readers need special aids in order to organize ideas into a cognitive framework. Teachers should ask those readers to mark places in a passage that are good for reflection and prediction. Some remedial reading teachers have successfully used road signs to signal students about difficult passages. A

sign could be used before difficult words or concepts. A

sign signals students to paraphrase ideas. Some readers need to be instructed repeatedly to restate information in their own words.

Study Strategies

14. Generative notetaking techniques

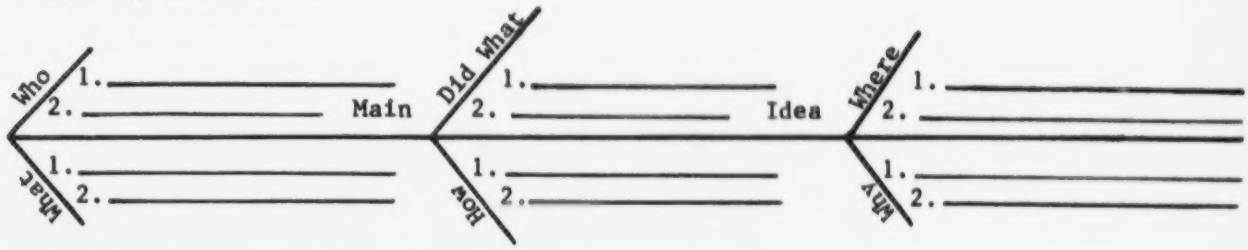
a. In the Cornell System of note-taking, Walter Pauk (How to Study in College, Walter Pauk, 1974) suggests that students divide their paper vertically into two columns: the one on the left is the recall column and is narrower than the column on the right which is for class notes. Students are taught to take notes in class during short lessons, followed by discussion and comparison of the note-taking. Then the group selects key words from the notes and writes them in the recall column. The key words are used to trigger recall of concepts, definitions, or facts. They can be used to self-check and, by overlapping all the pages of notes, students have a complete list of terms to review before a test.

b. A similar method is to divide notebook paper in half lengthwise. On the left, list the topics or main points discussed in the book, using the text headings when possible, and leaving space between topics. After students finish reading each section and think about what they have read, they list the main points on the right half of the paper.

c. Students can also be taught to organize key concepts and focus on important information by taking notes on 4 x 6 or 3 x 5 cards, formatted as below. The cards are also useful for review at a later date.

Main Idea	Supporting Information
Summary	

d. Herringbone Outline



15. Review and test taking techniques

a. At the first grade level, the chapter review sections of textbooks are often overwhelming to students. They require reading that only some of the class can do. Using an overhead projector to project the review pages focuses attention and allows the whole class to participate in the review. Key facts can be tested by deleting parts of the sentence. A reader can read aloud while a non-reader supplies the missing information. Using overheads, vocabulary words can be matched to pictures by having students draw lines to show their match. Parts of a sequence exercise can be moved into proper order.

b. The day before a test, the teacher could review important points with the class, using a handout that requires students to complete key information. Students who have particular difficulty taking tests can then use this paper during the test. It helps them focus, gives them confidence, and encourages them to take notes while reading.

c. The day before a "group quiz," divide the class into groups of three to five students. Each group should have one or two very competent students and some who need assistance. A group quiz should be made up from the most important material in the chapter, using questions of all levels (simple recall and complex problems). The students must work together to hand in one answer sheet for the group using about 2/3 of the class period. The students should understand before hand that 1/3 of the credit will be gained by one of their groupmates coming to the board and answering one or more bonus questions. The member of the group who answers the bonus is chosen at random so it is important that everyone in the group be helped to know as much material as possible in case they are called on to answer the bonus. Some groups like to stay together for the semester or year, while others prefer to change composition each time.

16. Graphic Organizers

Graphic organizers structure information in visual form. Information can be organized in a number of ways, including part to whole, hierarchical, sequential, cause/effect, and compare/contrast. Organizers are used in a variety of content areas, to introduce and develop vocabulary, teach concepts, show relationships, introduce new material, be used as a study guide or review, or to test comprehension. They have been used successfully in many classroom applications as a previewing activity, as a way of focusing reading, as a tool for review, and even to demonstrate competence.

To construct graphic organizers, you should:

1. Identify the main idea and write it on a sheet of paper.

2. Have students think of what they already know about the topic and decide what they expect to find in the chapter or questions they expect to find answered in the chapter.

   or

   Determine the concepts and facts that you want to teach by reading the text and highlighting or outlining the material. Select the critical concepts and facts that you would like your students to master.

3. Arrange the concepts and facts in a logical manner that best represents the body of knowledge.

4. Add graphics to increase interest and retention of information.

5. Prepare a completed conceptual map, a partially completed map, and a blank map. The blank map can be used on an overhead projector to introduce the subject.

To use graphic organizers to teach concepts, you should:

1. Give students any one of the maps depending on their ability and your purpose.

2. Present each of the concepts and related facts in order, using examples and non-examples.

3. Present any important facts.

4. Discuss the information, reviewing the content as you proceed and checking on students' acquisition of the concepts.

To use graphic organizers in vocabulary development, you should:

1. Choose a word or concept related to classroom work.

2. List the word on chart or chalkboard.

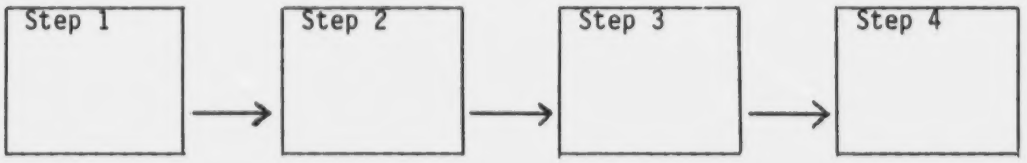
3. Encourage students to think of as many words as they can that are related to the selected key word and then to list the words by categories on a sheet of paper.

4. Students then share their prepared lists orally and all words are written on the class map in categories.

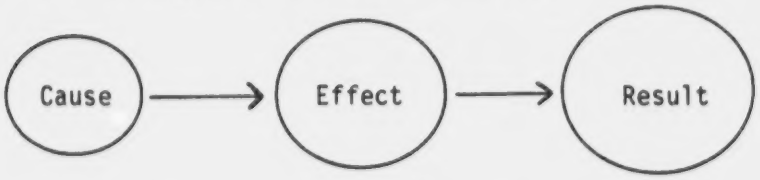
One way to introduce graphic organizers with young children is to ask students what real objects are related to a picture. For example, a sock, shoe, and sweater would belong in a picture of a child, while a chair would not. Related items can be connected to the picture with string. Once students understand the concept of organizers, you can move on to noun organizers.

Given a noun such as an animal, flower, or food, children can list characteristics that apply to the noun. For example, apples are sweet, juicy, red, good in pies, fun to pick, etc. The characteristics can be arranged around the word "apples" written on the board. Gradually more complex organizers can be developed, with categories and second and third level information.

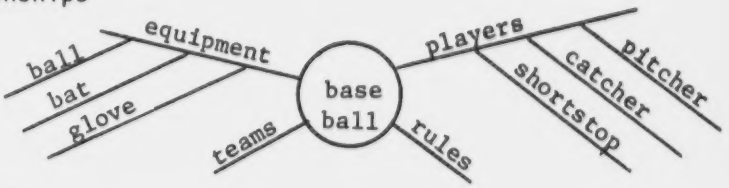
Graphic Organizer - Sequence



Graphic Organizer - Cause and Effect



Graphic Organizer - Show Relationships



Graphic Organizer - Focus Reading

Story Frame: Identifying Problems/Main Ideas

The problem in this story was _____

It started when _____

After that _____

Then _____

The problem is solved when _____

The story ends _____

Allow children to refine their answers so that the text makes sense. then test for comprehension.

17. Study guides

When textbooks or sections of textbooks are particularly difficult, teachers can develop their own worksheets. The following example is taken from adapted materials for A History of the United States by Boorstin and Kelley, 1980. The adapted materials were developed by Eudcation Development Center, Inc.

Read each word and the sentence that follows it. In the box, write the letter of the definition from the list below that you think best matches the word. Then copy the word and the correct definition on the response sheet.

[ ] **dynasty** (138) Washington and Jefferson were thought to be part of the "Virginia **dynasty**." although they were not related.

[ ] **substantial** (138) They were rich because they owned a **substantial** amount of land.

[ ] **pomp** (140) Many leaders surround themselves with a lot of **pomp**.

[ ] **moderate** (142) He was popular because of his **moderate** views.

a. large, important
b. succession of rulers who belong to the same family
c. kept within proper bounds; not extreme
d. stately or showy display

[ ] **militarism** (142) Jefferson did not believe in **militarism**.

[ ] **naturalization** (143) He became a citizen by **naturalization**.

[ ] **doctrines** (144) Jefferson explained his **doctrines** in a speech.

[ ] **artery** (144) The river was the major **artery** of trade in the area.

e. process of granting citizenship to a person born in another country
f. main road; important channel
g. policy of making military organization and military power very strong
h. principles or beliefs held as truth

[ ] **dictator** (145) Napoleon became the **dictator** of France.

[ ] **tributaries** (145) Most large rivers have many **tributaries**.

[ ] **statesmanship** (146) The Senator was praised for his **statesmanship**.

[ ] **river basin** (147, map) The Mississippi **river basin** covers much of the United States.

i. land that is drained by a river and its tributaries
j. streams or rivers that flow into a large body of water
k. skill in the management of public or national affairs
l. leader who uses total or complete power in ruling

Match each word with its definition by placing the correct letter in the box.

[ ] 1. **Napoleon** (145)
[ ] 2. **Haiti** (145)
[ ] 3. **Pierre Toussaint L'Ouverture**(145)
[ ] 4. **Continental Divide** (147, map)
[ ] 5. **judicial review** (152)

a. Caribbean Island once ruled by France
b. French leader who became a dictator
c. ridge in western North America that separates streams flowing toward the Atlantic Ocean from those flowing toward the Pacific Ocean
d. the right to review laws to decide whether or not they are in agreement with the Constitution
e. Haitian leader who lead fight against the French

Mark the time line on the response sheet with 1-year intervals beginning with 1800. Then refer to the page numbers to find the missing dates and plot all of the events on the time line.

a. **Spain Gives Louisiana To France 1800**
b. **Jefferson's First Inauguration (Page 140)**
c. **Marbury v Madison (Page 152)**
d. **Louisiana Becomes U.S. Property (Page 146)**
e. **Jefferson's Second Inauguration 1805**

1 Thomas Jefferson's dream for America was that it would grow into a land of self-governing farmers. He did not believe in industry. He did not think that government should spend much money—especially needlessly! He also believed in strict construction of the Constitution. Yet, while in office, he faced a situation that called for him to act against many of these beliefs. As you follow this Road Map, you will learn about this event and how Jefferson handled it.

2 **(138) Read the four paragraphs under the title "Jefferson in power."**

Describe the kind of people who ran the government in Virginia.

_____

_____

3 **(140-142) Read the section called "Thomas Jefferson."**

a. What were the views of Jefferson on slavery? Did he own slaves? _____

_____

_____

b. What languages did he know besides English? _____

_____

_____

4 **(142-143) Read the section called "The inaugural address."**

Study the six promises that Jefferson made in his inaugural address. Choose the one that you think is the most important. Tell why you chose that one.

_____

_____

_____

_____

_____

5 **(144) Read the paragraph under the title "Buying Louisiana."**

What were Jefferson's two basic political doctrines? _____

_____

6 **(144-145) Read the section called "The Mississippi River: artery for a continental nation."**

a. What river is called the "Father of Waters"? _____

b. What might have happened if an enemy took control of the mouth of the Mississippi?

_____

_____

_____

7 **(145) Read the section called "Napoleon's dream."**

a. How did the French change things for the Americans who used the Mississippi? _____

_____

_____

b. What were Monroe and Livingston sent to France to do? _____

_____

_____

8 (146) **Napoleon** had a plan to build a new French empire in America. First he would conquer the island of **Haiti.** Then he would take military control of Louisiana. Former slaves lead by **Toussaint L'Ouverture,** however, ruined his plan. They defeated his French troops in **Haiti. Read the section called "Napoleon decides to sell Louisiana."**

a. Why is it easier for a dictator to make quick decisions for his nation than it is for leaders of a republic to do so?

_____

_____

_____

b. Do you think that Livingston and Monroe were right to accept Napoleon's offer?

Why or why not? _____

_____

_____

9 (146) **Read the section called "Jefferson makes a hard decision."**

a. Why did the agreement to buy Louisiana put Jefferson on the spot? _____

_____

b. Why does it take a strong leader to change his mind publicly on an issue?

_____

_____

10 (147) The Mississippi is the most important river in the United States. **Look at the map that shows the Mississippi river basin.**

a. The Mississippi River basin drains the land between what two mountain ranges?

_____

_____

b. If your community is in the Mississippi River basin, name the tributary shown that it is closest to. _____

11 (147-148) **Read the section called "A new world."**

Make a list of four good results that came from buying the Louisiana territory.

_____

_____

_____

_____

12 (152) The Chief Justice of the Supreme Court was John Marshall. Under his leadership, the Supreme Court made a most important decision. **Read "Marbury v. Madison."**

a. What power did the Chief Justice state that the Supreme Court had?

_____

_____

b. What is the term for this power or right?

_____

c. How many justices are there on the court today? _____

13 **Now do YOU know?**

a. Why did Jefferson decide to go against his two basic political doctrines and to support the buying of Louisiana?

_____

_____

_____

_____

b. Why do you think that many historians say that this proved that Jefferson was a great leader?

_____

_____

_____

_____

Choose the best answer to complete each statement.

____1. Which of the following groups were not leaders in early 19th century Virginia?
a. substantial landowners b. former slaves c. rich white men

____2. Jefferson believed that _____was a great moral evil.
a. pomp . b. freedom of speech. c. slavery.

____3. The dictator of France in the early 1800s was
a. Toussaint L'Ouverture. b. Napoleon. c. Louis XIV.

____4. The river known as the "Father of Waters" is the
a. Potomac. b. Missouri. c. Mississippi.

____5. Monroe and Livingston were sent to France in 1803 to
a. overthrow the dictator Napoleon.
b. buy New Orleans and all the lands on the east bank of the river.
c. sell Louisiana to the French.

____6. The former slaves of Haiti defeated a take-over attempt by
a. France. b. Spain. c. the United States.

Answer each question.

7. Why did Monroe and Livingston agree to buy Louisiana before checking with the government in Washington?_____

_____

8. Why was the Mississippi River so important to Western Farmers?_____

_____

_____

9. What were two good results of the Louisiana Purchase?_____

_____

_____

10. What power did Chief Justice Marshall say the Supreme Court had over laws passed by Congress.

_____

_____

Essay Jefferson is considered to be one of our best presidents. What have you learned that makes you agree or disagree?

_____

_____

_____

_____

_____

_____

_____

_____

Experiential Activities

18. Using physical activity to demonstrate concepts

a. To make a science activity more real, have students act it out. For instance, once students know the definition of and have built series and parallel circuits, they need to understand the reason for the differences in the brightness of bulbs in each type of circuit and the relationship of the number of paths to the amount of resistance and current. Ask the class to imagine that all the students in the school are in the library when there is a fire alarm. Ask students what they think will happen as they try to get out through the one narrow exit. Relate the pushing and fighting to the definition of resistance-opposition for electrons flowing through a conductor. When there is only one path for electrons to follow as in a series circuit, there is increased resistance (pushing) and less current gets through. With all the students in the middle of the classroom and with only a narrow path for them to follow, count the number of students who are able to complete the path within 20 or 30 seconds. The same exercise can be done with a parallel circuit in which there is more current and less resistance since there are more paths for the electrons.

b. To explain molecular motion, have students on a dance floor represent a collection of gas molecules. They should be blindfolded or the room should be dark. The size of the floor represents volume, the speed of the music represents temperature and collisions of students with walls is pressure.

19. Making models

a. Students can make models of compounds using gumdrops to represent the atoms and toothpicks to represent the bonds that hold the compounds together. Using a periodic chart, students can predict the formulae for compounds and make models. At the end of class, students can eat their compounds.

b. Students can have fun creating (and later eating) cell models using jello, fruit slices, M and Ms, Life Savers, etc. for the components.

c. Using the same method, students can make concrete models of the abstract concept of balancing chemical equations. Using colored styrofoam balls or gum drops and toothpicks, or drilled colored wooden balls linked by tinker toys, students can experiment with chemical equations. For example, given ten hydrogen molecules and ten oxygen molecules, how many water molecules can you make? What molecules are left over? Now write the equation for what happened, listing all molecules that were used and that were formed? 10 hydrogens + 5 oxygens = 10 waters with 5 oxygens left.

d. Social studies events can be made more real by using manipulatives such as math manipulatives (unifix cubes, pattern blocks, etc.) as symbols for people and places. Encourage students to use the strategy when they are having difficult understanding the sequence of events. Ask students to read the passage and assign labels to non-descript objects or symbols. For instance, a sticky star attached to a block could represent a general. As students reread, they manipulate the labeled objects to represent the event.

Metacognition

20. Paraphrasing

As students read an assigned section of a chapter, they write on an index card one sentence that condenses, simplifies, or groups main ideas and supporting details for each paragraph or section read. At the end of the reading, all ideas are combined to form a sentence outline or serve as notes for review.

21. Inserting visual cues in important information

The teacher previews the book and draws a large question mark at the end of an important section or paragraph to signal that the child must remember one important fact from the section. The question mark is a visual clue that reinforces information, instills a questioning attitude, provide a consistent clue that important facts or information will precede the question mark.

22. Science Log

Today in science I learned _____

_____

_____

I don't understand _____

_____

_____

I'd like to know more about _____

_____

_____

23. Self-questioning techniques

Reaction Avenue Form

Name: _____

Lesson: _____

My Objectives: _____

_____

_____

Date: _____

(Initiatory Question) What are the uses of the Green Valley?

(Response) farming (R) light industry (R) homes

(Q) Are there many homes?

(Q) What type of farming?

(R) Truck Farming (R) Dairy farming

(Q) How does truck farming in the area compare with that of other areas we have studied?

(R) The truck farming is done on smaller acreage. The farms specialize in one crop culture.

(Q) What are the major characteristics of such truck farming?

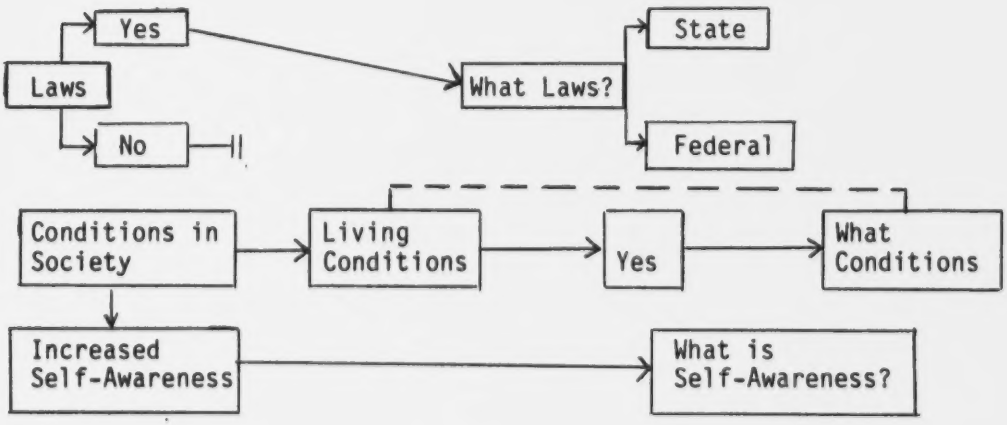
(R) The farms use irrigation, employ local workers, and have large amounts of machinery.

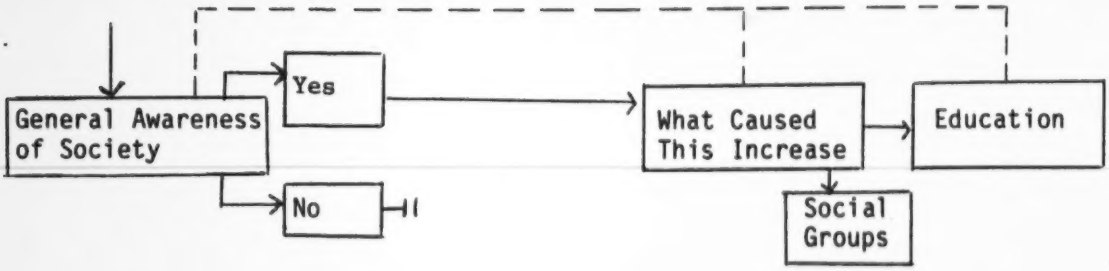
(Q) Are the farms using space wisely?

By using reaction avenues, students take dominant control of processing their data, for these avenues provide a means of accounting for their questions and the direction of their investigation. They have feedback on their effectiveness and if, upon analysis of the reaction avenue, they determine what they have not obtained the information desired, they can generate other questions and alter their direction of study.

Flow Chart

What were some basic reasons for the Civil rights struggle?





In the flow chart, students indicate choices regarding directions in which to proceed and delineate some major responses to particular questions. For instance, with regard to the question of general awareness, once the student had stated in the chart that, "Yes, it was true that general awareness had exerted some influence on civil rights activity," he could then raise the question, "What caused this increase?" In the example, the individual posed two things that might have contributed to the increase. More possibilities could have been suggested.

Cooperative Learning Strategies

24. Reviewing

Assign pairs of students to be responsible for selecting the most important material from a lesson or chapter and reviewing that material orally or in writing with the class. The teacher should monitor their presentations to make sure that key information is covered. Classmates should take notes and/or ask questions from the presentation.

25. Peer teaching

Student teams work together during reading, skimming, outlining. The leader of the team stops at intervals and reviews, questions, encourages new learning. The leader can question other members on facts, etc. Teams revolve to avoid personality difficulties, unbalanced teams.

26. Team reading

a. To help students focus attention on reading of the text, students can read the assigned materials orally with partners. They may choral read or take turns reading paragraphs or sections to each other.

b. Allow students to select one or two partners for a reading assignment. Each student reads aloud a portion and restates what s/he read to the other(s) cooperating in the group. Students with severe reading disabilities may choose to just restate what has been read instead of doing the reading. The entire small group must submit a summary of what was read on an index card in one or two sentences.

c. Divide the class into three or four groups depending upon how long a chapter is. Assign each group to read 1/3 or 1/4 of the chapter. After silent reading, each group discusses the selection and looks for the main ideas and specific details and takes notes. The next two or three days, groups and assignments are rotated so that each group reads the entire chapter. Then the whole class discusses the chapter with the teacher at the

board as note taker, writing the main ideas and specific details as students relate them. In essence, the teacher is writing an outline of the chapter.

27. Cooperative learning teams, games, tournaments

a. The teacher introduces or teaches the material. Students are divided into heterogeneous teams to complete worksheets, develop their own questions, ask teammates questions, etc., in order to more fully learn the material.

Students are tested individually. Teams that have improved most are recognized but individuals are not recognized, except for exceptional performance. The teacher can determine the form of recognition, e.g., a newsletter, a bulletin board.

Students are then sent to tournament tables divided according to ability levels. At the tournament tables, students ask other students questions that have been provided by the teacher or students. Students earn points for correct answers. Then they return to their "homebase teams" and add up all of their points. Teams are recognized based on the total number of points won by their team. Students do not stay at the same tournament table every week, but move, based on their performance at the previous tournament. Every student has the chance to give points to the team, not just the "smart" kids.

b. Divide the class into cooperative groups. Instruct students to make up a game that will teach others in the class pertinent information (vocabulary, concepts, etc.). Cooperative groups teach other groups their game in round robin fashion. Create a corner to store the games so that they can be shared with the whole class.

PHASE III DEMONSTRATING COMPETENCE AND EXTENDING KNOWLEDGE

Numerous Opportunities to Demonstrate Mastery

28. Questioning techniques

Teachers should elicit frequent responses from their students to monitor student learning and adjust the lesson when necessary to increase the quality of the lesson and keep students' attention. Teachers should allow ample wait-time. Wait-time is the length of time between a teacher's question and a student's answer or between the answer and the teacher's next question or comment. Its purpose is to allow students time to think about the question and formulate an answer, and the teacher time to consider the response before going on. There is some evidence to indicate that allowing a minimum of three seconds wait-time improves retention and understanding; other studies show that students perceive the lessons as less difficult when there are pauses between questions and responses.

Students can respond orally, in writing, or in some other way such as pointing or touching, using 'yes' and 'no' cards, putting thumbs up or down, using smile or frown cards. Teachers can call on volunteers or non-volunteers. Generally, volunteers should be called on only when everyone would not be expected to have the answer, because calling on individual volunteers involves only a small number of students and can give the teacher a distorted view of students' understanding of the subject under discussion. Calling on non-volunteers ensures active involvement of all students and gives the teacher more accurate feedback on students' knowledge. Non-volunteers can be called on randomly or in ordered turns. Calling on students in random order keeps all students alert and actively involved but may increase student anxiety and allow students to pay less attention when another student is called on. Allowing students time to formulate answers before calling on a particular student should lessen both these disadvantages.

Students can respond individually or in unison. Individual responses are best used to verify individual understanding, when the desired response is long, or when the response is a personal experience. Unison responses increase the amount of time that students are actively involved in instruction. Students can respond orally when short verbal answers are desired and when all students could be expected to use the same wording. Unison oral responses work best when the teacher provides a signal for students. Unison written responses work well during a lesson but there should be feedback after each item. You may wish to have students put their pencils down when the response is complete.

Teachers can use questions for a variety of purposes. Questions can be used to increase the pace of recitation or tutorial lessons to promote students' attention and decrease students' nondisruptive inattention. Ask as many drill questions and signal for as many student answers as you can on a given task. Maximize the number of student responses on a given task. Have students repeat the correct response many times. When verbally reinforcing the students' appropriate behavior or response, always state the reinforcement specifically and descriptively.

An excellent source for questioning techniques to improve comprehension is Sander, Classroom Questions: What Kinds?, published by Harper and Row (1966). If teachers are to stimulate children's thinking, Sanders recommends the following types of questions:

1. Memory - recalling information given in the passage. Four kinds of ideas are included:

   a. Facts (who, what, when, where, how)
   b. Definitions of terms used in the text
   c. Generalizations - recognizing common characteristics of a group of ideas: In what ways do _____ resemble _____? What events led to _____? How did _____ and _____ cause _____?
   d. Values - judgment of quality: What is said about _____? What kind of a girl was _____? What did _____ do that you wouldn't do?

2. Translations - expressing ideas in different form or language: Tell me in your own words _____. Could you draw a picture to show _____? Write a story pretending you are _____. What does the author mean by _____.

3. Interpretation - seeing relationships among facts, generalizations, values, etc.

   a. Comparative - are the ideas the same, different, or related:
      How is _____ like _____? Why? Which three are most alike?
   b. Implications - arriving at an idea that depends upon evidence in the passage:
      If _____ continues to _____, what will probably happen? What would happen if _____?
   c. Inductive thinking - applying a generalization to a group of observed facts:
      What is the author trying to tell you by _____? What facts in the story support the idea _____? What events led to _____?
   d. Quantitative - using a number of facts to reach a conclusion:
      How many times did _____ do _____? Then what happened? How many causes of _____ can you name?
   e. Cause and Effect - recognizing the events leading to a happening:
      What did the boy _____? How did the girl make _____ happen? Why did _____ happen? When the man _____, what had to happen?

4. Application - solving a problem that requires the use of generalizations, facts, and values:
   Mary has measles. What can we do to help her during her illness? How can we show her we think of her?
   How can we show that we need a school crossing guard? What plans do we have to make before we _____?

5. Analysis - recognizing and applying rules of logic to the solution of a problem:
   Some people think boys can run faster than girls. What do you think?
   Discuss the statement - "All children go to summer camp."

6. Synthesis - using original creative thinking to solve a problem:
   What other titles could you give to this story? What other ending can you think of for this story? If Jane had not _____, what might have happened?

7. Evaluation - making judgments based on clearly defined standards:
   Did you enjoy the story? For what reason? What did you think of Jim in this story? did you like what he did? Is this a fact or the author's opinion?

Variety of Ways to Demonstrate Competence

29. Student designed reviews and test

Using a fact or key concept from the reading lesson, the teacher models on the board how this one fact or concept can be asked as a true/false question, transformed into a multiple choice question, fill-in the blank, matching, or short answer essay. The teacher also models the type of answer expected for each type of question. Next, the teacher asks students to develop their own questions at random from the lesson or from a list of important facts and concepts elicited from the class or generated by the teacher. Students must know the answers to their own questions and they must have different kinds of

questions based on a variety of concepts. The number of questions will depend on students' age or ability. In groups of four or five, the students decide on a process for asking each other questions. Students keep an individual tally of the number of questions they believe they have answered correctly. The group self-corrects, with the teacher facilitating when there is a disagreement on an answer or how a question is worded. To bring closure, the cooperative groups may choose one question per student to ask the teacher. The teacher lets the students know if that concept (not that question) will be on the test. Or the cooperative groups choose five questions to ask the entire class, call on their peers for answers, and reinforce correct answers (e.g., role-play the teacher). Or the cooperative groups could choose five questions to submit to the teacher for use in the test. Students can use this strategy independently to prepare for a test, or pairs of students can work together writing and answering each other's questions.

30. Alternative Testing Techniques

Dr. John Junkala of Boston College suggests the following:

1. If a child has difficulty writing essays, use the fill-in-the-blank or frame-type test instead.

2. If a child has difficulty with fill-in-the-blank, give him/her beginning letters to aide visually or the number of letters that the word has (b , or _ _ _ _ _ _ _ _).

3. If a child cannot answer questions with that help, give the child a choice of answers (bicycle, car, or wagon).

   a. Answers can be on a printed test or on word cards placed on the desk so that the child picks up the correct answer.

   b. Students can read or point to the correct answer projected on an overhead, written on the board, or from a printed list that is not attached to the test.

   c. Answers can be written on "shoe" word cards and placed on the floor for children to step or hop on.

   d. Students can select the correct word cards from those hung on a clothesline or select the correct picture or object from a group.

4. If reading the test questions is too difficult, all of the above may be done orally after the test is read to the children.

After the test, the teacher can work with the child to show how the answer could have been written as an essay type answer.

31. Extending/applying learning

Students can demonstrate their understanding of content area information in many ways. Role playing is a method of acting out a hypothetical but familiar situation. The situation is described to the role players, who then enact

their roles according to how they think it would feel to be in that situation. Experience with similar situations is not a prerequisite. The sketches are usually brief.

Students can assume the role of a thing, plant, animal, machine, piece of furniture. They can make a presentation or respond to questions from the class, such as:

What kind of plant (animal, machine, etc.) are you?
What do you see and hear?
What things do you see that have pleased you today?
What do you do on weekends?
Tell about the care you receive.
What important person would you like to live with?

Role plays can also be used to demonstrate many scientific cycles--food cycle, water cycle, etc. For example, in the oxygen and carbon dioxide cycle, students make signs for oxygen and carbon atoms, water and sugar molecules, respiration, photosynthesis, and burning processes, living and nonliving things such as plants, animals, coal, gas, machines, etc. Assign students to hold the signs and act out the story as it is read. The first time this is done as a class, the teacher should make up and tell the story of the oxygen atom and his adventures. As the story progresses, the students assigned as oxygen atoms act out the story going to other students whose sign is appropriate to the story. For example, the oxygen atom might be breathed in by a fox and used in respiration to burn food, and then combined with another oxygen atom and carbon atom to form carbon dioxide and exhaled. One student who is oxygen has to go to the student with the animal sign and to the respiration sign, then hold hands with a carbon and another oxygen student, until the cycle is complete.

Once the class has done this activity once, half the class can write a creative story about another cycle and the reminder of the class can act it out.

Role play activities can provide an opportunity to learn research skills and oral presentation skills.

When presenting a history lesson dealing with conflicts, introduce the lesson by explaining the conflict, but not the outcome. Assign roles of people or countries to individual students. For example, assign student A to be powerful Italy, the country that controls the land route to Asia in the 1400s. Assign student B to be powerful Portugal who controls the sea route to Asia in the 1400s. Assign student C to be Spain who is becoming fearful of its two powerful neighbors.

In their roles, have students answer such questions as: Will Italy allow Spain to use its land route? Will Portugal allow Spain to use its sea route? How does Spain feel about this situation? What does Spain wish it could do? What would Spain be willing to risk in order to become powerful?

Questions can be opened to the entire class at any appropriate time. Students could change roles halfway through this activity.

Role plays provide an opportunity to dramatize or make a time period more real. Individual students can research a character in history, science, or literature and report on that person dressed in costume. Classmates can guess who the character is. Presentations can be videotaped and shown at a later date. A department or whole school can set aside a day when all students participate in a dress-up or costume day.

For example, students come to school dressed as a '20s character--flapper, matron, Al Capone, Lindbergh, Bobby Jones, Father Coughlin, Gertrude Ederle, etc. They have done some research and are prepared to give a brief sketch of who they are, what they did, where they found an authentic costume, etc. Teachers can also dress up.

Role plays can also be used to understand a concept such as trial by jury. Have students role play Goldilocks vs. the Three Bears, with Goldilocks being charged with breaking and entering. The teacher should choose the defense lawyer and the prosecutor. By lot, draw for the roles of the defendent, witnesses, judge, clerk of court, and the jury. If possible, assign each student a role. The amount of background preparation for each role and the amount of teacher direction is left to the discretion of the teacher. The defense and prosecution will need several days notice in order to prepare their cases. The same technique can be used to help students understand or demonstrate their understanding of collective bargaining.

Students can debate issues such as slavery, whether the world is flat or round or whether the United States should conduct covert operations. They can develop a new broadcast or newspaper based on the Roman period. Students might include news about chariot wrecks on the Appian Way, events at the Coliseum, edicts from Caesar, etc. They could even include commercials or display ads.

APPENDIX B

TEXTBOOKS ANALYZED

TEXTBOOKS ANALYZED

SCIENCE

Science
Silver Burdett
(1987)
Grade 1

Heath Science
D.C. Heath
(1985)
Grade 3

Holt Science
Holt, Rinehart, and Winston
(1986)
Grade 5

Focus on Earth Science
Merrill
(1987)
Grade 8

Focus on Physical Science
Merrill
(1987)
Grade 9

Modern Biology
Holt, Rinehart, and Winston
(1985)
Grade 10

SOCIAL STUDIES

Families and Neighborhoods
Silver Burdett
(1986)
Grade 1

City, Town and Country
Scott, Foresman
(1986)
Grade 3

The United States: Past to Present
D. C. Heath
(1987)
Grade 5

United States History: Reconstruction to the Present
Merrill
(1986)
Grade 10

Land of Promise: A History of the United States:
Scott, Foresman
(1987)
Grade 10

Triumph of the American Nation
Harcourt, Brace, Jovanovich
(1986)
Grade 10

APPENDIX C

TEACHER-REVIEWERS

TEACHER-REVIEWERS

LOUISE R. BREWSTER
Science Teacher
Browns River Middle School
Underhill, Vermont,

SHARON COROLOGOS
Elementary Teacher
Richmond, Vermont

CHARLES HODSDON
Science Teacher
Masconomet Regional High School
Topsfield, Massachusetts

CHERYL MALONEY
Social Studies Teacher
Weston High School
Weston, Massachusetts

JOSEPH P. O'BRIEN
Elementary Teacher/Principal
Underhill, Vermont

JULIA D. PHELPS
Social Studies Teacher
Mastricola Middle School
Merrimack, New Hampshire

BARBARA SORIS
Elementary Teacher
Dover, New Hampshire

KATHY T. WILLIAMSON
Science Teacher
Camels Hump Middle School
Richmond, Vermont

APPENDIX D

VERIFICATION TEACHERS

Fredric Bartek
Norton High School
Norton, Massachusetts

Mary Beech
Sequoia High School
Redwood City, California

Louise Brewster
Browns River Middle School
Underhill, Vermont

William Brundage, Jr.
Gloucester High School
Gloucester, Massachusetts

Noella Byam

Chelmsford, Massachusetts

Carol Ciampa
Memorial School
Burlington, Massachusetts

Betsy Walsh Connolly
Foster Elementary School
Hingham, Massachusetts

Margaret Davin
Ashfield Elementary School
Brockton, Massachusetts

Elin Dozois
Phippsburg Elementary School
Phippsburg, Maine

Helen Fournier
Ashfield Elementary School
Brockton, Massachusetts

Vivian Gamache
Elizabeth Pole School
Taunton, Massachusetts

Charles Hodsdon
Masconomet Regional High School
Topsfield, Massachusetts

Erik Jarvi
Varnum Brook Middle School
Pepperell, Massachusetts

Patty Jerman
Irving Junior High School
Colorado Springs, Colorado

Wendy Johansen
Phippsburg Elementary School
Phippsburg, Maine

Paul Kolman
Newburyport High School
Newburyport, Massachusetts

John Landry
Wethersfield High School
Wethersfield, Connecticut

Kathleen Lang
Center School
Litchfield, Connecticut

Virginia Ann Lavoie
Carlton School
Salem, Massachusetts

Jean MacDonald
Needham High School
Needham, Massachusetts

Cheryl Ryan Maloney
Weston High School
Weston, Massachusetts

Mary Lou Martin
Memorial School
Burlington, Massachusetts

Ginny Mitstifer
Lincoln School
Melrose, Massachusetts

Joseph P. O'Brien
Underhill School
Underhill, Vermont

Karen O'Donnell
South Row School
Chelmsford, Massachusetts

Frances Pearlman
Shurtleff School
Chelsea, Massachusetts

Julia Phelps
Mastricola Middle School
Merrimack, New Hampshire

Charles Pirello
Central Middle School
Waltham, Massachusetts

Janice Pomerleau
Solmonese School
Norton, Massachusetts

Bobby Prewitt
Hawley Elementary School
Newtown, Connecticut

Leslie Smith
Beneke Elementary School
Houston, Texas

Barbara Soris
Woodman Park School
Dover, New Hampshire

Art Soucy
Pollard Middle School
Needham, Massachusetts

Ralph Stewart
Wethersfield High School
Wethersfield, Connecticut

Katherine Tomich
Linden-McKinley High School
Columbus, Ohio

Gary Vermillion
Thomas Jefferson High School
Dallas, Texas

Janet Whelan
Foster Elementary School
Hingham, Massachusetts

Connie White
Columbus Public Schools
Columbus, Ohio

Kathy Williamson
Camels Hump Middle School
Richmond, Vermont

Ann Wolf
Plymouth Carver
Intermediate School
Plymouth, Massachusetts

APPENDIX E

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